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AL-ADAN HOSPITAL
Antimicrobial Policy

Antibiotic Policy Committee, Al adan hospital 2018

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DRUG ERUPTION & REACTION MANUAL
22nd EDITION
Physical Diagnosis
CARDIOLOGY
GANONG'S PHYSIOLOGY
Textbook of Pharmacognosy & Phytochemistry
Internal Medicine Handbook
Intensive Review of Internal Medicine
CARDIOLOGY PHARMACY
POCKET EMERGENCY MEDICINE

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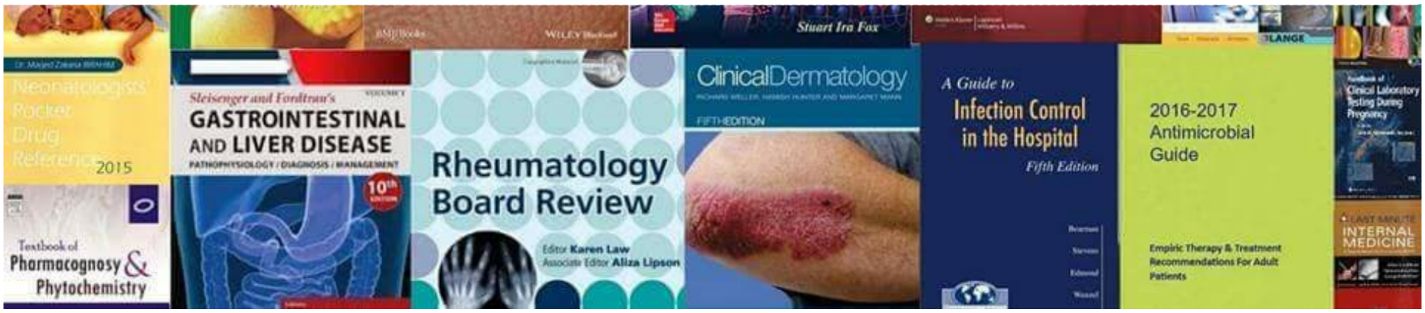
Neonatologists' Pocket Drug Reference 2015
Textbook of Pharmacognosy & Phytochemistry
GASTROINTESTINAL AND LIVER DISEASE
Rheumatology Board Review
ClinicalDermatology
A Guide to Infection Control in the Hospital
2016-2017 Antimicrobial Guide
INTERNAL MEDICINE

Al Adan Hospital Antibiotic Policy

Prepared by the Antibiotic Policy Committee, which is the subcommittee of Infection Control Committee.
First Edition 2018

http://louli.ca/Adan/contact.php

The Antibiotic Policy developed by dr. Ahlam Jeragh
With the approval of all hospital disciplines.

Preface

Infections remain a leading cause of high rate of mortality and morbidity globally. Good antimicrobial prescribing will help to reduce the rate of antibiotic resistance emerges and spreads. It will also minimize the many side effects associated with antibiotic prescribing, such as *Clostridium difficile* infection and fungal infections due to changes of normal flora. It should be borne in mind that antibiotics are not needed for simple colds or viral infections.
Antibiotic resistance is now a major issue confronting healthcare providers and patients.
As an effort to face these challenges, this policy was developed. The antimicrobial policy is based on current guidelines, literature reviews and the local antibiogram of Al Adan Hospital. It provides treatment guidelines for the most common situations in which antibiotic treatment is required.
To have successful implementation of this policy, there must be in place restrictive measures, adequate educational programs, appropriate antimicrobial agents in the policy, good surveillance program and periodic audit. I trust that my colleagues in the hospital will follow the Antimicrobial Policy to ensure patient are receiving the appropriate treatment and reduce the antimicrobial resistance.

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Head of Infection control Department,
Member of Antibiotic Policy Committee.
Al Adan Hospital

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I am particularly grateful for the assistance given by the microbiology doctors and senior Technologist to provide me with the microbiological data for the antibiogram.

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Introduction

It has been estimated that at least fifty percent of patients receive antimicrobials needlessly. Reasons include inappropriate prescribing for antimicrobial prophylaxis, continuation of empiric therapy despite negative cultures in a stable patient, and a lack of awareness of susceptibility patterns of common pathogens. Over prescribing not only increases the costs of health care, but may result in an infection due to antimicrobial-resistant bacteria, as well as opportunistic fungi, and may increase the likelihood of an adverse drug reaction. On the other hand, not prescribing antimicrobial for certain clinical cases may also lead to serious consequences.

The primary objective of this antibiotic policy is to ensure the appropriate selection of antimicrobials for the prevention and treatment of infection within Al Adan Hospital. The choices of antimicrobials included in the policy have been carefully selected to move to agents with a lower risk of precipitating health care associated infections, including MRSA, *Clostridium difficile* and multidrug / pan drug resistant *Enterobacteriaceae / Pseudomonas spp.*

This document is not intended to offer a comprehensive guide to the management of all infections but has been designed as a prescribers' reference for the management of a number of community and hospital acquired infections.

The selection criteria for empirical treatment regimens have been based on:

- Surveillance of the susceptibility profiles of major pathogens to classes of established antimicrobial agents.
- Correlation of the activity of each antimicrobial therapy against the range of probable infective agents
- Pharmacokinetics
- Toxicity
- National guidelines
- Cost

When considering the empirical treatment of infections, antimicrobial therapy should normally be withheld until appropriate specimens are collected and a microbiological diagnosis is reached, unless:

- the patient is immunocompromised.
- a life-threatening infection is evident or suspected.

In these situations antimicrobial therapy should commence immediately.

Where treatment durations are given these are meant as a guideline only. Treatment durations may need to be extended depending on clinical response.

These guidelines are for empirical therapy only. When results from cultures are available treatment should be reviewed and, wherever possible, narrow spectrum (targeted) therapy should be substituted.

Penicillin Allergy:

Patients with a history of angioedema, anaphylaxis, or severe skin reaction to any beta lactam antibiotics, are likely to have **a true penicillin allergy** and are therefore at an increased risk of immediate hypersensitivity to penicillins. They should **not** receive beta–lactam antibiotic (these include penicillins, cephalosporins, monobactams and carbapenems).

Patients with a minor or delayed rash, may not have a true penicillin allergy and can therefore they can take cephalosporin, monobactams or carbapenem but **not** a penicillin.

Switching from Intravenous Antibiotic to Oral Therapy:

Parenteral route can be switch to oral route if:

I. Markers showing a trend towards normal: Patient should be apyrexial for the last 24 hours (Temp>36° C and <38° C)
and NOT have more than one of the following, heart rate>90/min, respiratory rate >20/min, BP unstable, WCC<4 or>12 White cell count should show a trend towards normal; absence of such should not impede the switch if a ll other criteria are met and not neutropenic.
II. Patient able to tolerate oral feeding.
III. Specific indication/deep-seated infection (Prior to switch refer to table 1)

Certain infections may appear to respond promptly to intravenous therapy, but warrant prolonged IV therapy. This is to ensure that adequate drug levels are attained at the site of infection and to optimise the response and prevent relapse.

Discuss with Microbiology before switching patients with a high risk/deep seated infection to oral therapy.

Table 1:

Deep seated infections that may require an initial two weeks of IV therapy	**High risk infections requiring prolonged IV therapy**
• Liver abscess • Osteomyelitis, • Septic arthritis • Empyema • Cavitating pneumonia	• *S. aureus* bacteremia. • Severe necrotizing soft tissue • Infections • Severe infections during chemotherapy related • Neutropenia • Infected implants/prosthesis • Meningitis/encephalitis • Intracranial abscesses • Mediastinitis • Endocarditis • Exacerbation of cystic fibrosis/ Bronchiectasis • inadequately drained abscesses or empyema

Part I: Guidelines for Empirical Treatment for adults

Cardiovascular System

	Empiric therapy	**Alternative therapy**	**Duration**
Endocarditis native valve	Vancomycin IV 15-20 mg/kg 12 hr. (trough concentration 15-20 µg/ml) Plus: Gentamicin 1mg/kg 8 hr.	To be discussed with Clinical Microbiologist.	To be discussed with Clinical Microbiologist
Endocarditis prosthetic valve	Vancomycin IV 15-20 mg/kg 12 hr. (trough concentration 15-20 µg/ml) Plus: Gentamicin 1mg/kg 8 hr. Plus: Rifampin 600 mg Oral/IV 12 hr.	To be discussed with Clinical Microbiologist	To be discussed with Clinical Microbiologist
Pericarditis (Bacterial)	Ceftriaxone IV 2g. 24 hr.	Vancomycin IV 15-20 mg/kg 12 hr.	To be discussed with Clinical Microbiologist
Pacemaker/ Defibrillator infection	Device removal plus Cefazolin 2g IV.	To be discussed with Clinical Microbiologist	To be discussed with Clinical Microbiologist

Sepsis:

Due to	Empiric therapy	Alternative therapy	Duration
Community acquires suspected: abdominal source Urinary Pyelonephritis sources	Amoxicillin-Clavulanate acid Oral Extended release tablet 1 gm 12 hourly Or IV 1.2 g 8 hr. Or Piperacillin- tazobactam IV 4.5 g 8 hr. (To be increase 6 hr. in sever sepsis).	In case of penicillin allergy: Gentamycin IV 3-5 mg/kg daily in 3 doses (to monitor serum gentamicin level) Ciprofloxacin IV 400 mg 12 hr.	10 – 14 days
Suspected community acquired pneumonia source	Ceftriaxone IV 2 g 24hr. (If patient presented with leukopenia to add clindamycin or linezolid)	Levofloxacin oral or IV 500 – 750 mg 24 hr. Or Moxifloxacin oral or IV 400 mg 24hr	7 -14 days
Suspected biliary source	Piperacillin- tazobactam IV 4.5g 8 hr.	Ciprofloxacin IV 400 mg 12 hr.	10 -14 days
Suspect illicit IV drug use source	Vancomycin IV Loading dose: 25 -30 mg/ kg Then 15-20 mg/kg 12 hr. (to check the trough level, target 15-20 µg/mL)	to be discussed with the Microbiologist	
Source unclear	Piperacillin- tazobactam IV 4.5 g 8 hr.	Meropenem IV 1 gm 8 hr.	to be discussed with the Clinical Microbiologist
Hospital acquired	Meropenem IV 1 gm 8 hr.	High critical area to be discussed with the Clinical Microbiologist.	
For patient on dialysis: Line associated bacteremia	Vancomycin IV loading dose: 20mg/kg Then 500 mg each subsequent dialysis session Plus Ceftazidime IV 1gm after each dialysis session	- If patient on non-cuffed dialysis catheter it is preferable to remove the catheter before starting the empirical regimen. - If patient has tunneled cuffed dialysis catheter it is preferable to start the antimicrobial agents using antibiotic catheter lock. (Refer to the policy of the nephrology unit).	
If sever infection or immunocompromised or femoral tunneled catheters	Add Caspofungin IV Loading dose 70 mg then 50 mg per day.	- The duration to be discussed with the Clinical Microbiologist.	

Central Nervous System			
	Empiric therapy	**Alternative therapy**	**Duration**
Bacterial meningitis	Ceftriaxone IV 2g 12 hr. plus Vancomycin IV 45-60 mg/kg/day 6 hr.	to be discussed with the Microbiologist	10-14 days
Post traumatic or post neurosurgery Or Shunt related meningitis	Vancomycin IV Loading dose: 25 -30 mg/ kg Then 15-20 mg/kg 12 hourly (to check the trough level, target 15-20 µg/mL) Plus Ceftazidime IV 2g 8 hr. Or Cefipime IV 2g 8 hr.	Vancomycin IV Loading dose: 25 -30 mg/ kg Then 15-20 mg/kg 12 hourly (to check the trough level, target 15-20 µg/mL) Plus Meropenem IV 2gm 8 hr.	to be discussed with the Clinical Microbiologist
Brain abscess	Ceftriaxone IV 2g 12hr Plus Metronidazole IV 7.5 mg/kg 6hr.	Penicillin G 3-4 million units IV 4hr. Plus Metronidazole IV 7.5 mg/kg 6hr.	to be discussed with the Clinical Microbiologist
Bacterial Meningitis if suspected *Mycobacteria tuberculosis*	Isoniazid 5mg/kg first day then 15 mg/kg/day Rifampin 10 mg/kg/day Pyrazinamide 15-30 mg/kg/ first dose then 50-70 mg/kg/day Ethambutol 15-25 mg/kg/ first dose then 50 mg/kg/day	to be discussed with the Clinical Microbiologist	12 months

Head and Neck:

	Empiric therapy	Alternative therapy	Duration
Facial cellulitis	Flucloxacillin IV 2gm 6 hr. Plus Clindamycin IV 600 mg 8 hr.	Ceftriaxone IV 2 gm 24 hr. Plus Metronidazole IV 500 mg 6-8 hr.	7-10 days
Acute mastoiditis	Ceftriaxone IV 2 gm 24 hr.	Levofloxacin IV or Oral 500 mg once daily	
Acute otitis media	Amoxicillin Oral 500 mg 8hr.	Amoxicillin-Clavulanate acid Oral Extended release tablet 1 gm 12 hr. Or IV 1.2 g 8 hr. Or Moxifloxacin Oral 400 mg 24hr.	7-10 days
Parotitis	Flucloxacillin IV 2gm 6 hr. and Metronidazole IV 500 mg 6-8 hr.	Clindamycin 600 mg IV 6-8 hr. Or Vancomycin IV Loading dose: 25 -30 mg/ kg Then 15-20 mg/kg 12 hourly (to check the trough level, target 15-20 µg/mL)	10 -14 days
Pharyngitis / tonsillitis	Amoxicillin 500 mg Oral 8hr. Or Benzathine penicillin 1.2 million units IM one daily dose.	Clindamycin Oral 300mg 8 hr.	10 days
Epiglottitis	Ceftriaxone 2 gm IV 24hr Plus Vancomycin IV Loading dose: 25 -30 mg/ kg Then 15-20 mg/kg 12 hr. (to check the trough level, target 15-20 µg/mL)	Levofloxacin IV 500 - 750 mg 24hr. Plus Clindamycin IV 600-900 mg 6-8 hr.	10 days
Sinusitis	Amoxicillin-Clavulanate acid Oral Extended release tablet 1 gm 12 hourly Or IV 1.2 g 8 hr.	Levofloxacin Oral 500-750 mg 24 hr.	7-14 days

Ophthalmology:

	Empiric therapy	Alternative therapy	Duration
Acute dacryocystitis	Amoxicillin-Clavulanate acid Oral Extended release tablet 1 gm 12 hourly Or IV 1.2 g 8 hr. Sever infection or penicillin allergy: Vancomycin IV Loading dose: 25 -30 mg/ kg Then 15-20 mg/kg 12 hr. (to check the trough level, target 15-20 µg/mL)	Ceftriaxone IV 1gm 24 hr.	7-10 days
Preseptal cellulitis	Amoxicillin-Clavulanate acid Oral Extended release tablet 1 gm 12 hourly Or IV 1.2 g 8 hr.	Ceftriaxone IV 1gm 24 hr.	7-10 days
Orbital cellulitis	Flucloxacillin IV 2gm 4-6 hr. Plus Ceftriaxone IV 1gm 24 hr.	Moxifloxacin Oral 400 mg 24 hr.	14 days
Orbital fracture or penetrating trauma Without foreign body	Ciprofloxacin 400 mg IV 12 hr. At the day of admission.		1 day
penetrating trauma With metallic or intraocular foreign body	Ciprofloxacin 400 mg IV 12 hr., at the day of admission. Followed by Moxifloxacin 400 mg Orally 24hr.		7-10 days
Retinitis HSV VZV	Acyclovir 10-12 mg/kg IV 8 hr.	Valaciclovir Oral 1000 mg 8 hr.	7-10 days
Retinitis CMV	Ganciclovir 5 mg/kg IV12 hr. (2-3 weeks) then Valganciclovir Oral 900 mg 24 hr.	Induction (2-3weeks): Foscarnet 90 mg/kg IV 12 hr. Maintenance dose: Foscarnet 90 mg/kg IV 24 hr,	6 months

Respiratory Tract:

	Empiric therapy	Alternative therapy	Duration
COPD	Amoxicillin-Clavulanate acid Oral 1 gm 12 hourly Or IV 1.2 g 8 hourly	Moxifloxacin Oral 400 mg 24hr.	7-10 days
Community acquired pneumonia	Mild - moderate: Clarithromycin Oral 1gm 24 hr. Plus Amoxicillin-Clavulanate acid Oral 1 gm 12 hourly Or IV 1.2 g 8 hourly	Moxifloxacin Oral 400 mg 24hr.	5-7 days
	Severe: Piperacillin- tazobactam 4.5 g IV 6 hr. - if high risk of MRSA carrier or post influenza or IV drug users or Gram stain showing gram positive cocci in cluster Add: Linezolid IV 600 mg 12 hr. - if there is history of pseudomonal colonization lung disease, or suspected atypical pneumonia, add: Levofloxacin IV 750 mg 24 hr.	Meropenem1gm IV 8hr. - if high risk of MRSA carrier or post influenza or IV drug users or Gram stain showing gram positive cocci in cluster Add: Linezolid IV 600 mg 12 hr. - if there is history of pseudomonal colonization lung disease, or suspected atypical pneumonia, add: Levofloxacin IV 750 mg 24 hr.	14-21 days (to be discussed with the Microbiologist)
Health care associated pneumonia	Vancomycin IV Loading dose: 25 -30 mg/ kg Then 15-20 mg/kg 12 hr. (to check the trough level, target 15-20 µg/mL) Plus Piperacillin- tazobactam IV 4.5 g 6 hr.	Linezolid IV 600 mg 12 hr. Plus Meropenem 1g IV 8 hr. If patient carrier of MDR organisms or in case of ICU outbreak of Acinetobacter To discuss with Microbiologist.	10-14 days
Ventilator associated pneumonia	Piperacillin- tazobactam IV 4.5 g 6 hr. -if case of MRSA carrier, add: Vancomycin IV Loading dose: 25 -30 mg/ kg Then 15-20 mg/kg 12 hr. (to check the trough level, target 15-20 µg/mL)	Tigecycline IV loading dose 100 mg then 50 mg 12 hr. - For critical cases in the intensive care unit (ICU) please follow the local policy of ICU, and discuss the cases with the Microbiologist.	7-10 days
Aspiration pneumonia	Ceftriaxone IV 2gm 24 hr. Plus Clindamycin IV 600 mg 8 hr. Or Metronidazole IV 500 mg 8 hr.	Piperacillin- tazobactam IV 4.8 mg 6 hr.	14- 21 days

Intra-abdominal:

	Empiric therapy	Alternative therapy	Duration
Diverticulitis	Mild - moderate Ciprofloxacin Oral 750 mg 12 hr. Plus Metronidazole Oral 500mg 6hr. Severe: Piperacillin- tazobactam IV 4.5 g 6 hr.	In case of penicillin allergy: Tigecycline IV loading dose 100 mg then 50 mg 12 hr.	7-10 days
Gall bladder infection Cholecystitis Cholangitis Biliary sepsis	Piperacillin- tazobactam IV 4.5 g 8 hr.	Discuss with Microbiologist.	
Liver abscess	Ceftriaxone IV 2gm 24hr Plus Metronidazole IV 500mg 8hr	Piperacillin- tazobactam IV 4.5 g 8 hr.	Discuss with Microbiologist
Gastric or duodenal ulcer	Proton pump inhibitor 20 mg 12 hr. Plus Amoxicillin Oral 1gm 12 hr. Plus Clarithromycin Oral 500 mg 12 hr.	In case of penicillin allergy: Proton pump inhibitor 20 mg 12 hr. Plus Metronidazole Oral 500 mg 12 hr. Plus Clarithromycin Oral 500 mg 12 hr.	14 days
Spontaneous bacterial peritonitis Primary infection	Ceftriaxone IV 2g 24 hr.	Piperacillin- tazobactam 4.5 g IV 8 hr. Or If sever: Meropenem IV 1gm 8hr	7-10 days
Secondary Peritonitis (rupture, perforation or abscess)	Mild to moderate: Amoxicillin-Clavulanate acid Oral 1 gm 12 hourly Or IV 1.2 g 8 hourly If severe: Piperacillin- tazobactam IV 4.5 g 8 hr.	In case of penicillin allergy: Tigecycline IV loading dose 100 mg then 50 mg 12 hr.	10-14 days
Peritonitis associated with chronic ambulatory peritoneal dialysis (CAPD)	-If the residual urine less than 100 ml/day: Vancomycin 30 mg/kg/bag max 2g at start. Next dose after 5-7 days, depend on the trough level Plus Gentamicin 0.6 mg/kg/bag 6 hr. -If the residual urine more than 100 ml/day: Vancomycin 30 mg/kg/bag max 2g at start. Next dose after 5-7 days, depend on the trough level Plus Ceftazidime 20 mg/kg/bag 6 hr.		Duration 10-14 days. (The need for prolong duration will depend on the etiological agents, and need to be discussed with microbiologist).

Skin and soft tissue:

	Empiric therapy	**Alternative therapy**	**Duration**
Cellulitis	Penicillin G IV 1-2 million units 6hr Plus / or cloxacillin IV 2gm 4 hr.	Discuss with Microbiologist	7-10 days Longer if patient in sepsis.
Necrotizing fasciitis	Piperacillin- tazobactam IV 4.5 g 6 hr.	In case of penicillin allergy: Tigecycline IV loading dose 100 mg then 50 mg 12 hr.	14-21 days (may need prolong duration)
Skin abscess, boils, impetigo or furuncles	Clindamycin Oral 450 mg 6 hr.	Doxycycline Oral 100 mg 12hr.	5-7 days
Wound infection	Clean procedure: Clindamycin Oral 450 mg 6 hr. Or Cloxacillin IV 2gm 4 hr. Clean – contaminated procedure: Amoxicillin-Clavulanate acid Oral tablet 1 gm 12 hourly Or IV 1.2 g 8 hourly Contaminated procedure: Piperacillin- tazobactam IV 4.5 g 8 hr.	In case of penicillin allergy or sever cases: Clean -contaminated procedure: Ciprofloxacin Oral 500 mg 12 hr. Plus Vancomycin IV Loading dose: 25 -30 mg/ kg Then 15-20 mg/kg 12 hr. (to check the trough level, target 15-20 µg/mL) Plus Metronidazole Oral 500 mg 8 hr. Contaminated procedure: Tigecycline IV loading dose 100 mg then 50 mg 12 hr. Plus Metronidazole Oral 500 mg 8 hr.	5-7 days
Human bite	Amoxicillin-Clavulanate acid Oral 1 gm 12 hr. Or IV 1.2 g 8 hourly	Clindamycin Oral 450 mg 6 hr.	5-7 days
Animal bite	Amoxicillin-Clavulanate acid Oral 1 gm 12 hr. Or IV 1.2 g 8 hourly	Clindamycin Oral 450 mg 6 hr. plus -If dog bit, add: ciprofloxacin Oral 500 mg 12 hr. - if cat bite, add Doxycycline Oral 100 mg 12 hr.	5-7 days To consider anti-tetanus prophylaxis and rabies immunization.

Musculoskeletal:			
	Empiric therapy	**Alternative therapy**	**Duration**
Diabetic foot	Piperacillin- tazobactam IV 4.5 g 8 hr. (If suspected MRSA add linezolid 600 mg IV or PO 12 hr.)	Tigecycline IV loading dose 100 mg then 50 mg 12 hr.	Discuss with Microbiology.
Acute osteomyelitis	Ciprofloxacin IV 400 mg 12 hr. first 2 weeks then to switch for oral therapy. Plus Cloxacillin IV 2gm 6 hr.	Ceftriaxone IV 1g 24 hr. If suspected MRSA Add Vancomycin IV Loading dose: 25 -30 mg/ kg Then 15-20 mg/kg 12 hr. (To check the trough level, target 15-20 µg/mL). Discuss with Clinical Microbiology.	6-12 weeks
Chronic osteomyelitis	Discuss with Clinical Microbiology		
Prosthetic joint infection	Vancomycin IV Loading dose: 25 -30 mg/ kg Then 15-20 mg/kg 12 hr. (To check the trough level, target 15-20 µg/mL). - Consider adding rifampin Oral 600 mg once daily	Linezolid IV or Oral 600 mg 12 hr.(maximum duration 28 days)	Minimum 4 weeks
Bursitis	Cloxacillin IV 2gm 6 hr.	Linezolid IV or Oral 600 mg 12 hr. (maximum duration 28 days).	7-10 days
Septic arthritis	Ceftriaxone IV 1-2 g 24 hr.	Ciprofloxacin PO 750 mg 12 hr. Plus Clindamycin Oral 600 mg 8 hr.	10-14 days
Pyomyositis	Cloxacillin IV 2gm 6 hr.	Linezolid IV or Oral 600 mg 12 hr. (maximum duration 28 days).	7-10 days

Genitourinary system:

	Empiric therapy	Alternative therapy	Duration
Acute uncomplicated cystitis	Nitrofurantoin 100 mg Oral 6hr. Or TMP-SMX DS 1Tab 12 hr.	Amoxicillin-Clavulanate acid Oral Extended release tablet 1 gm 12 hr. Or IV 1.2 g 8 hr. Or Ciprofloxacin Oral 250mg 12hr.	3- 5 days
Complicated UTI Or Catheter related UTI	Piperacillin- tazobactam IV 4.5 g 6 hr.	Ciprofloxacin Oral 500 mg 12hr.	7-14 days
Pyelonephritis	Piperacillin- tazobactam IV 4.5 g 6 hr.	Ciprofloxacin Oral 500 mg 12hr. - In severe cases: Meropenem 1gm IV 8 hr.	14 days
Urethritis	Azithromycin Oral 1gm one dose Plus Doxycycline Oral 100 mg 12 hr.	Levofloxacin Oral 500 mg once daily.	7 days
Acute Prostatitis	Ceftriaxone IM 250 mg **ONE DOSE.** Plus Doxycycline Oral 100 mg 12 hr.	Ciprofloxacin Oral 500-750 mg 12 hr. Or TMP-SXT 1 DS tab. Oral 12 hr.	10 -14 days
Chronic Prostatitis	Ciprofloxacin Oral 500 mg12 hr. Or TMP-SXT 1 DS tab. Oral 12 hr.	Levofloxacin Oral 750 mg once daily	1-3 months
Epididymo-orchitis	Ceftriaxone IM 250 mg once daily. Plus Doxycycline Oral 100 mg 12 hr.	Levofloxacin Oral 750 mg once daily	10 days
Pelvic inflammatory diseases	Ceftriaxone IM or IV 250 mg ONE DOSE. Plus Metronidazole Oral 500 mg 12 hr. Plus Doxycycline Oral 100 mg 12 hr.	Clindamycin IV 900 mg 8 hr. or Oral 450 mg 6 hr. Plus Doxycycline Oral 100 mg 12 hr.	14 days
Amnionitis / septic abortion	Piperacillin- tazobactam IV 4.5 g 6 hr.	Ceftriaxone IV 2 gm 24 hr. Plus Clindamycin IV 450-900 mg 8 hr.	7-10 days
Postpartum endometritis	Piperacillin- tazobactam IV 4.5 g 6 hr.	Gentamicin IV 5 mg/kg once daily Plus Clindamycin IV 900 IV 8 hr.	10 days
Vaginitis/ Bacterial Vaginosis	Metronidazole Oral 500 mg 12 hr.	Clindamycin Oral 300 mg 12 hr.	7 days

Part II: Guidelines for Empirical Treatment for pediatrics:

ANTIBIOTIC TREATMENT GUIDELINES FOR CHILDREN 1 MONTH TO 18 YEARS

Antibiotics should be selected to cover the most likely pathogens in a given situation. Ideally, bacteriological evidence of infection and antibiotic sensitivities should be taken into account. If these are not available when antibiotic therapy must be started.

Always take samples before starting antibiotics, but in serious infections administration of antibiotics should NOT be delayed whilst undertaking or waiting for results of investigations.

For serious infections ensure patients receive a dose as soon as possible.

Feverish Illness in children

Infection	Antibiotic Therapy	Penicillin Allergy	Comments
Children < 3 months	Cefotaxime IV 50 mg/kg 8 hr. (6 hr. in severe infections) Plus Ampicillin IV 25-50 mg/kg 6 hr.	Clarithromycin IV 7.5 mg/kg 12 hr. Plus Ampicillin IV 25-50 mg/kg 6 hr.	- Ampicillin added to cover for *Listeria monocytogenes.*
Children > 3 months	Cefotaxime IV 50 mg/kg 8 hr. (6 hr. in sever infections)	Clarithromycin IV 7.5 mg/kg 12 hr.	

Gastrointestinal infections:

Infection	Antibiotic Therapy	Penicillin Allergy	Comments
Diarrhoea and Vomiting Likely to be viral Adenovirus Enterovirus Rotavirus Noravirus (SRSV – small round structured virus)	Antibiotics are not indicated		
Intra-abdominal sepsis and post-operative intra-abdominal infections (eg gangrenous appendix)	Amoxicillin- clavulanic acid IV 30 mg/kg 8 hr. Or Piperacillin / Tazobactam IV 112.5 mg/kg (max.4.5 g) 6-8 hr.	Vancomycin IV 15 mg/kg 8 hr Plus Amikacin IV 7.5 mg/kg 8 -12 hr Plus Metronidazole 7.5 mg/kg 8hr.	5-14 days
Campylobacter / Salmonella / Shigella enteritis	Must be based on culture results Usually self-limiting		
E coli 0157	**Conservative management** **Antibiotic therapy is not recommended**		

Respiratory Tract Infections:

<table>
<tr><th>Infection</th><th>Antibiotic Therapy</th><th>Penicillin Allergy</th><th>Comments</th></tr>
<tr>
<td>**Acute Otitis Media**

Usually viral</td>
<td>**Non- severe:**
Amoxicillin Oral
30 mg/ kg 8 hr.

If no response :
Amoxicillin- clavulanic acid IV 30 mg/kg 8 hr.</td>
<td>**Non- severe:**
Erythromycin Oral
<table>
<tr><td>Age</td><td>Gose</td></tr>
<tr><td>< 2 yrs</td><td>125 mg 6 hr.</td></tr>
<tr><td>2 – 8 yrs</td><td>250 mg 6 hr.</td></tr>
<tr><td>8 – 18 yrs</td><td>250-500 mg 6 hr</td></tr>
</table>
Or

Clarithromycin Oral :
<table>
<tr><td>Body weight</td><td>Dose mg</td></tr>
<tr><td>8 -11 kg</td><td>62.5 / 12 hr.</td></tr>
<tr><td>12- 19 kg</td><td>125 / 12 hr.</td></tr>
<tr><td>20 -29 kg</td><td>187.5 / 12 h</td></tr>
<tr><td>> 30 kg</td><td>250 /12 hr</td></tr>
</table>
Severe:
Clarithromycin IV 7.5 mg/kg 12 hr.</td>
<td>Most uncomplicated Cases resolve without antibiotics.

Manage pain and fever.

Antibiotics indicated if:
- <6 months of age
- Bilateral and <2years of age
- Unilateral with ottorhoea
- Evidence of mastoiditis
- Severe or no improvement after 48-72 hours.

Duration
Non severe and >5years: 5 days
Severe or < 5years: 10 days</td>
</tr>
<tr>
<td>**Mastoiditis**</td>
<td>Amoxicillin- clavulanic acid IV 30 mg/kg 8 hr.

Severe:
Cefotaxime IV 50 mg/kg 8 hr.</td>
<td>Clindamycin IV 3.75 – 6.25 mg/kg 6 hr.
(sever infection 10 mg/kg 6-8 hr.)</td>
<td>**Duration:**
The appropriate duration will depend on the clinical presentation and the presence of mastoid abscess.</td>
</tr>
<tr>
<td>**Acute Sinusitis**</td>
<td>**Non- severe:**
Amoxicillin- clavulanic acid Oral
<table>
<tr><td>Age</td><td>Oral suspentions</td><td>Dose</td></tr>
<tr><td>< 6 yr</td><td>125/31</td><td>0.25 ml/kg 8 hr.</td></tr>
<tr><td>6 -12 yr</td><td>250/62</td><td>0.15ml/kg 8 hr.</td></tr>
<tr><td>> 12 yr</td><td>250/125</td><td>8 hr</td></tr>
</table>
Severe:
Amoxicillin IV 50/kg 6 hr.
Or
Cefotaxime IV 50 mg/kg 8 hr.
(6 hr. in sever infections)</td>
<td>**Non- severe:**
Erythromycin Oral
<table>
<tr><td>Age</td><td>Gose</td></tr>
<tr><td>< 2 yrs</td><td>125 mg 6 hr.</td></tr>
<tr><td>2 – 8 yrs</td><td>250 mg 6 hr.</td></tr>
<tr><td>8 – 18 yrs</td><td>250-500 mg 6 hr</td></tr>
</table>
Or

Clarithromycin Oral :
<table>
<tr><td>Body weight</td><td>Dose mg</td></tr>
<tr><td>8 -11 kg</td><td>62.5 / 12 hr.</td></tr>
<tr><td>12- 19 kg</td><td>125 / 12 hr.</td></tr>
<tr><td>20 -29 kg</td><td>187.5 / 12 hr.</td></tr>
<tr><td>> 30 kg</td><td>250 /12 hr</td></tr>
</table>
Severe:
Clarithromycin IV 7.5 mg/kg 12 hr.</td>
<td>Likely viral and do not require antibiotics.

Consider antibiotics if:
- Persistent or worsening symptoms (e.g. purulent nasal discharge, daytime cough, fever) for > 7-10 days.

- Severe infection.

Duration:
Non-severe: 10-14 days
Severe: 10-14 days</td>
</tr>
</table>

<table>
<tr><th></th><th></th><th></th><th></th></tr>
<tr>
<td>Tonsillitis
Usually viral agents or
<i>Group A beta-haemolytic Streptococci</i></td>
<td>Non- severe:
Amoxicillin Oral
40 mg/ kg 8 hr.
Severe:
Benzylpenicllin (Penicillin G)
IV 25/ kg 6 hr.
Duration
Non- severe: 10 days
Severe: 10 days</td>
<td>Non- severe:
Erythromycin Oral
<table>
<tr><td>Age</td><td>Gose</td></tr>
<tr><td>< 2 yrs</td><td>125 mg 6 hr.</td></tr>
<tr><td>2 – 8 yrs</td><td>250 mg 6 hr.</td></tr>
<tr><td>8 – 18 yrs</td><td>250-500 mg 6 hr</td></tr>
</table>
Or
Clarithromycin Oral :
<table>
<tr><td>Body weight</td><td>Dose mg</td></tr>
<tr><td>8 -11 kg</td><td>62.5 / 12 hr.</td></tr>
<tr><td>12- 19 kg</td><td>125 / 12 hr.</td></tr>
<tr><td>20 -29 kg</td><td>187.5 / 12 hr.</td></tr>
<tr><td>> 30 kg</td><td>250 /12 hr</td></tr>
</table>
Severe:
Clindamycin IV 3.75 – 6.25 mg/kg 6 hr.</td>
<td>- Most sore throats are vira
- Consider antibiotic treatment if 3 out of 4 Centor Criteria:
1) Tonsillar exudate
2) Tender anterior cervica lymph nodes
3) history of fever
4) absence of cough
Or
If features of systemic upset,
peritonsillar cellulitis or abscess, at increased risk from acute infection (e.g. immunocompromised, CF)
or
history of valvular heart disease.
SEND THROAT SWAB for culture and sensitivity.
Do not use amoxicillin or Co-amoxiclav in case patient has infectious mononucleosis as causes rash.

Drainage is essential part of treatment.
Send pus for C&S.</td>
</tr>
<tr>
<td>Peritonsillar/ Retropharyngeal abscess
Anaerobes
Group A strep
<i>S. aureus</i>
+/- coliforms</td>
<td>Initially treat with IV antibiotics
Amoxicillin- clavulanic acid IV 30 mg/kg 8 hr.
sever infection;
Cefotaxime IV 50 mg/kg 8 hr.
Plus
Clindamycin IV 3.75 – 6.25 mg/kg 6 hr.</td>
<td>Initially treat with IV antibiotics
Clindamycin IV 3.75 – 6.25 mg/kg 6 hr.</td>
<td></td>
</tr>
<tr>
<td>Acute Epiglottitis</td>
<td>Initally treat with IV antibiotics then oral.
Cefotaxime IV 50 mg/kg 8 hr.
If severe, add:
Clindamycin IV 3.75 – 6.25 mg/kg 6 hr.</td>
<td>To contact the microbiologist.</td>
<td><u>Secure airway first and call anaesthetist</u>
Avoid upsetting child.

Duration 10-14 days</td>
</tr>
<tr>
<td>Pertussis</td>
<td>Non-severe:
Erythromycin Oral
<table>
<tr><td>Age</td><td>Gose</td></tr>
<tr><td>< 2 yrs</td><td>125 mg 6 hr.</td></tr>
<tr><td>2 – 8 yrs</td><td>250 mg 6 hr.</td></tr>
<tr><td>8 – 18 yrs</td><td>250-500 mg 6 hr.</td></tr>
</table></td>
<td>Clarithromycin Oral :
<table>
<tr><td>Body weight</td><td>Dose mg</td></tr>
<tr><td>8 -11 kg</td><td>62.5 / 12 hr.</td></tr>
<tr><td>12- 19 kg</td><td>125 / 12 hr.</td></tr>
<tr><td>20 -29 kg</td><td>187.5 / 12 hr.</td></tr>
<tr><td>> 30 kg</td><td>250 /12 hr</td></tr>
</table></td>
<td>Ensure vaccination history obtained

duration 7 days</td>
</tr>
</table>

<table>
<tr><td></td><td>Severe:
Clarithromycin IV 7.5 mg/kg 12 hr.</td><td></td><td></td></tr>
<tr><td>Tracheitis with Secondary bacterial infection
Mainly caused by respiratory viruses</td><td>Amoxicillin IV 50/kg 6 hr.
Or
Amoxicillin- clavulanic acid IV 30 mg/kg 8 hr.</td><td>Clarithromycin IV 7.5 mg/kg 12 hr.</td><td>Ensure airway secure and avoid upsetting child.
If not responding to initial treatment after 72hours send sputum for MC&S and start antibiotics.
Duration 5-7 days.</td></tr>
<tr><td>Bronchiolitis with secondary bacterial infection
Viral, RSV.</td><td>Non-severe:
Amoxicillin Oral 40 mg/ kg 8 hr.
Severe:
Cefotaxime IV 50 mg/kg 8 hr.</td><td>Non- severe:
Erythromycin Oral
<table>
<tr><td>Age</td><td>Gose</td></tr>
<tr><td>< 2 yrs</td><td>125 mg 6 hr.</td></tr>
<tr><td>2 – 8 yrs</td><td>250 mg 6 hr.</td></tr>
<tr><td>8 – 18 yrs</td><td>250-500 mg 6 hr</td></tr>
</table>
Or
Clarithromycin Oral :
<table>
<tr><td>Body weight</td><td>Dose mg</td></tr>
<tr><td>8 -11 kg</td><td>62.5 / 12 hr.</td></tr>
<tr><td>12- 19 kg</td><td>125 / 12 hr.</td></tr>
<tr><td>20 -29 kg</td><td>187.5 / 12 hr.</td></tr>
<tr><td>> 30 kg</td><td>250 /12 hr</td></tr>
</table>
Severe:
Clindamycin IV 3.75 – 6.25 mg/kg 6 hr.</td><td>Duration:
5-7 days</td></tr>
<tr><td>Uncomplicated Community Acquired Pneumonia
Common causes:
RSV, respiratory viruses, Strep <i>pnemoniae</i>. H. <i>influenza,</i> S. <i>aureus</i>.
In school age also atypicals <i>(</i>M.<i>pneumonia</i> Chlamydia)</td><td>Amoxicillin Oral 40 mg/ kg 8 hr.
(Add macrolide if no response).
If S.aureus suspected (e.g. bullae on CXR) add Clindamycin IV.
*Sever case should be discussed with the Microbiologist.</td><td>Erythromycin Oral
<table>
<tr><td>Age</td><td>Gose</td></tr>
<tr><td>< 2 yrs</td><td>125 mg 6 hr.</td></tr>
<tr><td>2 – 8 yrs</td><td>250 mg 6 hr.</td></tr>
<tr><td>8 – 18 yrs</td><td>250-500 mg 6 hr</td></tr>
</table>
Or
Clarithromycin Oral :
<table>
<tr><td>Body weight</td><td>Dose mg</td></tr>
<tr><td>8 -11 kg</td><td>62.5 / 12 hr.</td></tr>
<tr><td>12- 19 kg</td><td>125 / 12 hr.</td></tr>
<tr><td>20 -29 kg</td><td>187.5 / 12 hr.</td></tr>
<tr><td>> 30 kg</td><td>250 /12 hr</td></tr>
</table>
Severe:
Clindamycin IV 3.75 – 6.25 mg/kg 6 hr.</td><td>Duration:
- 7-10 days
- 14 days for S. <i>aureus</i>
-
3 weeks for <i>mycoplasma, chlamydia</i></td></tr>
</table>

Severe CAP	Cefotaxime IV 50 mg/kg 8 hr. Plus Clarithromycin IV 7.5 mg/kg 12 hr.	Vancomycin IV 15 mg/kg 8 hr If S.aureus suspected (e.g. bullae on CXR) add: Clindamycin IV 3.75 – 6.25 mg/kg 6 hr.	**Duration:** 2-3 weeks
Hospital acquired Pneumonia **Or** **Ventilator Associated pneumonia** (Tendency towards more resistant organisms such as Enterobacteriaceae and Pseudomonas *aeruginosa).*	IV Piperacillin / Tazobactam IV 112.5 mg/ kg 8 hr. Or Meropenem IV Under 50 kg: 10-20 mg/kg 8 hr. Over 50 kg: 1 g 8 hr. (For severe Pseudomonal infection.)	Vancomycin IV 15 mg/kg 8 hr Plus Amikacin IV 7.5 mg/kg 8 -12 hr	**Monitor the level of vancomycin and amikacin.** **Duration:** 7-10 days 2 weeks for S. aureus /MRSA 2-3 weeks for Pseudomonas
Empyema	**Acute, community acquired usually parapneumonic:** Cefotaxime IV 50 mg/kg 8 hr. Plus Clindamycin IV 3.75 – 6.25 mg/kg 6 hr. **Sub-acute/ chronic, or Hospital acquired:** Piperacillin / Tazobactam IV 112.5 mg/ kg 8 hr.	**To discus with Microbiologist**	**Duration 2-4 weeks**
Aspiration pnuemonia	Amoxicillin- clavulanic acid IV 30 mg/kg 8 hr.	Clindamycin IV 3.75 – 6.25 mg/kg 6 hr.	**Duration 14-21 days**

CNS infections:

Infection	Antibiotic Therapy	Penicillin Allergy	Comments
Bacterial meningitis and meningococcal disease **Empiric therapy**	Cefotaxime 300-400 mg/kg/ Day IV (6-8hr.) (max. 12 g daily) plus Ampicillin 300-400 mg/kg/ Day 4-6 hr. (max. 2 g 4 hr.) (IV Dexamethasone 0.15mg/kg max 10mg qds for 4 days)	Chloramphenicol IV 25 mg/kg 6 hr.	Do not use corticosteroids in children < 3 months **Add** Dexamethasone if lumbar puncture shows any of the following: -CSF is very purulent, - CSF WBC count > 1000/microlitre - raised CSF WBC count and protein greater than 1g/litre - bacteria on gram stain Give dexamethasone preferably before or with first dose of antibiotics or within 4 hours, (if missed do not start 12 hours or later after starting antibiotics). **Avoid dexamethasone** in septic shock, meningococcal septicaemia, if immunocompromised, or in meningitis following surgery. At discretion of Consultant
For all ages: If recent multiple antibiotics exposure or overseas travel	Consider adding Vancomycin IV 15 mg/kg 8 hr.		
If signs/symptoms suggestive of herpes simplex encephalitis	Add IV Aciclovir 30-45 mg/kg / day (8 hr.)		

Infection	Antibiotic Therapy	Penicillin Allergy	Comments
For confirmed disease: **Children < 3 months:**			For the febrile patient Perform lumbar puncture on 20th day of 3 week course, before decision is made to stop treatment. Duration 21 days
Neisseria meningitidis	Cefotaxime IV 50 mg/kg 6 hr. (max. 12 g daily) for 7 days in total.	Chloramphenicol IV 25 mg/kg 6 hr.	
Group B streptococci	Cefotaxime IV 50 mg/kg 6 hr. (max. 12 g daily)	Vancomycin IV 15 mg/kg 8 hr	
Listeria monocytogenes	Ampicillin IV 50 mg/kg 4-6 hr. (max. 2 g 4 hr.) for 21 days plus Gentamicin IV 7 mg/kg 8 hr. For 7 days	Trimethoprim-Sulfamethoxazole 20 mg/kg IV 6-12 hr.	
Gram negative bacilli	Cefotaxime IV 50 mg/kg 6 hr.for at least 21 days	Discuss with Microbiologist.	
For unconfirmed disease: **Children < 3 months**	Cefotaxime IV 50 mg/kg 6 hr. Ampicillin IV 50 mg/kg 4-6 hr. (max. 2 g 4 hr.) for at least 14 days.	Vancomycin IV 15 mg/kg 8 hr Plus Gentamicin IV 7 mg/kg 8 hr. For 7 days	Failed lumbar puncture or negative blood/CSF culture and/or blood/CSF PCR
For confirmed disease: **Children > 3 months** *Neisseria meningitidis* *Strep pneumoniae* *H. influenzae type b*	Cefotaxime IV 50 mg/kg 6 hr.	If history of immediate hypersensitivity to penicillin or cephalosporin : Vancomycin IV 15 mg/kg 8 hr	Do not give Ceftriaxone with calcium containing fluids Duration: 7 days in total. 14 days

For unconfirmed disease: **Children > 3 months**	Cefotaxime IV 50 mg/kg 6 hr.	If history of immediate hypersensitivity to penicillin or cephalosporin : IV Vancomycin	Failed lumbar puncture or negative blood/CSF culture and/or blood/CSF PCR Do not give ceftriaxone with calcium containing fluids. Duration 10 days

Ophthalmology infections:

Infection	Antibiotic Therapy	Penicillin Allergy	Comments
Penetrating injury to the eye **Children < 3 months with possible UTI**[1]	Ceftriaxone 50 mg/ kg IV 24 hr. Amoxicillin 40 mg/ kg Oral 8 hr. Or Cefotaxime 50 mg/kg IV 6 hr.	Amikacin 7.5 mg/kg IV 8 -12 hr	Treat as per feverish illness in children **Duration:** 5- 7 days **Duration:** 7 days
Acute pyelonephritis Infants and children > 3 months	Cefotaxime 50 mg/kg IV 6 hr.	Amikacin 7.5 mg/kg IV 8 -12 hr	**Duration:** 10 days
Cystitis/Lower UTI Infants and children > 3 months	Amoxicillin 40 mg/ kg Oral 8 hr.	Trimethoprim-Sulfamethoxazole 18 mg/kg IV 12 hr. or 24mg/kg Oral 12 hr.	Asymptomatic bacteriuria should **not** be treated with antibiotics **Duration:** 3 days

Bone and Joint Infections:

Infection	Antibiotic Therapy	Penicillin Allergy	Comments
Osteomyelitis and Septic Arthritis Organisms:			See also feverish illness in children
< 3 months Group B Strep. Staph aureus Coliforms	Cefotaxime 50 mg/kg IV 6 hr	Clindamycin IV 3.75 – 6.25 mg/kg 6 hr.	**Duration:** 14 – 21 days IV, treat for 6 weeks total .
3 months to 5 years Staph. aureus Kingella kingae S pneumoniae Haemophilus sp. E coli	Cefotaxime 50 mg/kg IV 6 hr	Clindamycin IV 3.75 – 6.25 mg/kg 6 hr.	**Duration:** 4 weeks IV or depending on radiology or clinical decision. If source identified and sensitive can step down to PO Flucloxacillin if appropriate.
> 5 years Staph. aureus	Flucloxacillin 50 mg /kg IV (max. 2g) 6 hr.	Clindamycin IV 3.75 – 6.25 mg/kg 6 hr.	**Duration:** 4 weeks IV or depending on radiology or clinical decision
***Salmonella* osteomylitis**	Cefotaxime 50 mg/kg IV 6 hr Or Ciprofloxacin 20-30mg/kg/ day IV (divided 12 hr.)	Ciprofloxacin 20-40 mg/kg/ day IV (divided 12 hr.)	**Duration:** 4-6 weeks depending on radiology or clinical decision.

Skin and Soft Tissue Infections:

<table>
<tr><th>Infection</th><th>Antibiotic Therapy</th><th>Penicillin Allergy</th><th>Comments</th></tr>
<tr>
<td>Erysipelas
Group A Strep
(most common
Staph. aureus

If severe</td>
<td>Amoxicillin- clavulanic acid Oral:
<table>
<tr><th>Age</th><th>Oral suspentions</th><th>Dose</th></tr>
<tr><td>< 6 yr</td><td>125/31</td><td>0.25 ml/kg 8 hr.</td></tr>
<tr><td>6 -12 yr</td><td>250/62</td><td>0.15ml/kg 8 hr.</td></tr>
<tr><td>> 12 yr</td><td>250/125</td><td>8 hr</td></tr>
</table>

Benzylpenicllin (Penicillin G) IV 25 mg/ kg 6 hr.
Plus
Flucloxacillin 50 mg /kg IV (max. 2g) 6 hr.</td>
<td>Erythromycin Oral
<table>
<tr><th>Age</th><th>Gose</th></tr>
<tr><td>< 2 yrs</td><td>125 mg 6 hr.</td></tr>
<tr><td>2 – 8 yrs</td><td>250 mg 6 hr.</td></tr>
<tr><td>8 – 18 yrs</td><td>250-500 mg 6 hr.</td></tr>
</table>
Or
Clarithromycin Oral :
<table>
<tr><th>Body weight</th><th>Dose mg</th></tr>
<tr><td>8 -11 kg</td><td>62.5 / 12 hr.</td></tr>
<tr><td>12- 19 kg</td><td>125 / 12 hr.</td></tr>
<tr><td>20 -29 kg</td><td>187.5 / 12 hr.</td></tr>
<tr><td>> 30 kg</td><td>250 /12 hr</td></tr>
</table>

Severe:
Clindamycin IV 3.75 – 6.25 mg/kg 6 hr.</td>
<td>Increasing resistance of group A Strep against macrolides, review if no improvement.

If known Staph aureus PO Flucloxacillin
Duration
7-10 days based on clinical decision, further treatment if indicated clinically</td>
</tr>
<tr>
<td>Cellulitis
Staph aureus
Group A Strep
or other
Streptococci</td>
<td>Benzylpenicllin (Penicillin G) IV 25 mg/ kg 6 hr.
Plus
Flucloxacillin 50 mg /kg IV (max. 2g) 6 hr.</td>
<td>Clindamycin 3 – 6 mg/kg Oral 6 hr.

Or

Clindamycin 3.75 – 6.25 mg/kg 6 hr.</td>
<td>Duration
7-10 days based on clinical decision, further treatment if indicated clinically</td>
</tr>
</table>

<table>
<tr>
<td>**Infected Eczema**
Staph aureus</td>
<td>Amoxicillin- clavulanic acid Oral:
<table>
<tr><td>Age</td><td>Oral suspentions</td><td>Dose</td></tr>
<tr><td>< 6 yr</td><td>125/31</td><td>0.25 ml/kg 8 hr.</td></tr>
<tr><td>6 -12 yr</td><td>250/62</td><td>0.15ml/kg 8 hr.</td></tr>
<tr><td>> 12 yr</td><td>250/125</td><td>8 hr</td></tr>
</table>
Or
Clindamycin 3 – 6 mg/kg Oral 6 hr.</td>
<td>Erythromycin Oral
<table>
<tr><td>Age</td><td>Gose</td></tr>
<tr><td>< 2 yrs</td><td>125 mg 6 hr.</td></tr>
<tr><td>2 – 8 yrs</td><td>250 mg 6 hr.</td></tr>
<tr><td>8 – 18 yrs</td><td>250-500 mg 6 hr</td></tr>
</table>
Or
Clarithromycin Oral :
<table>
<tr><td>Body weight</td><td>Dose mg</td></tr>
<tr><td>8 -11 kg</td><td>62.5 / 12 hr.</td></tr>
<tr><td>12- 19 kg</td><td>125 / 12 hr.</td></tr>
<tr><td>20 -29 kg</td><td>187.5 / 12 hr.</td></tr>
<tr><td>> 30 kg</td><td>250 /12 hr</td></tr>
</table></td>
<td>As guided by skin swabs
Duration:
10 days</td>
</tr>
<tr>
<td>**Preseptal Cellulitis**
Staph aureus
Coagulase negative staph
Streptococci
Anaerobes
Haemophilus influenzae</td>
<td>Amoxicillin- clavulanic acid
IV 30 mg/kg 8 hr.</td>
<td>Clindamycin 3.75 – 6.25 mg/kg 6 hr.</td>
<td>Risk of extension into the orbit in young children
Duration:
Ideally 2 weeks however oral step down can be considered on clinical grounds</td>
</tr>
<tr>
<td>**Orbital cellulitis**</td>
<td>Flucloxacillin 50 mg /kg IV (max. 2g) 6 hr.
Or
Cefotaxime 50 mg/kg IV 6 hr</td>
<td>Clindamycin 3.75 – 6.25 mg/kg 6 hr.
Or
Vancomycin IV 15 mg/kg 8 hr</td>
<td>**Ophthalmic Emergency**
Infection of soft tissues behind orbital septum.
Refer urgently to Ophthalmology
Refer to ENT.
If no improvement within 48 hours consider adding Metronidazole.
Duration:
Minimum 2 weeks, longer needed</td>
</tr>
<tr>
<td>**Dog bite / Human bite**</td>
<td>Amoxicillin- clavulanic acid Oral:
<table>
<tr><td>Age</td><td>Oral suspentions</td><td>Dose</td></tr>
<tr><td>< 6 yr</td><td>125/31</td><td>0.25 ml/kg 8 hr.</td></tr>
<tr><td>6 -12 yr</td><td>250/62</td><td>0.15ml/kg 8 hr.</td></tr>
<tr><td>> 12 yr</td><td>250/125</td><td>8 hr</td></tr>
</table></td>
<td>Clindamycin 3 – 6 mg/kg Oral 6 hr.
Or
Metronidazole 30-40 mg/kg/ day Oral (divided 6 hr.)</td>
<td>**Duration:**
5 to 7 days</td>
</tr>
</table>

Part III: Guidelines for Empirical Treatment for Neonates:

<table>
<tr><th colspan="4">Neonatal infections:</th></tr>
<tr><th>Infection</th><th>Antibiotic Therapy</th><th>Penicillin Allergy</th><th>Comments</th></tr>
<tr>
<td>Early neonatal sepsis

(including neonatal pneumonia)</td>
<td>IV Ampicillin 50 mg/dose 12 h
<table>
<tr><th>PMA (weeks)</th><th>Postnatal (days)</th><th>Interval (hrs.)</th></tr>
<tr><td>≤29</td><td>0-28</td><td>12</td></tr>
<tr><td></td><td>≥28</td><td>8</td></tr>
<tr><td>30-36</td><td>0-14</td><td>12</td></tr>
<tr><td></td><td>≥14</td><td>8</td></tr>
<tr><td>37-44</td><td>7</td><td>12</td></tr>
<tr><td></td><td>≥7</td><td>8</td></tr>
<tr><td>≥45</td><td>All</td><td>6</td></tr>
</table>
Plus
Gentamicin IV
<table>
<tr><th>PMA (weeks</th><th>Post-natal (days)</th><th>Dose (mg/kg)</th><th>Interval (hrs)</th></tr>
<tr><td>≤29</td><td>0-7
8-28
≥29</td><td>5
4
4</td><td>48
36
24</td></tr>
<tr><td>30-34</td><td>0-7
≥8</td><td>4.5
4</td><td>36
24</td></tr>
<tr><td>≥35</td><td>All</td><td>4</td><td>24</td></tr>
</table>
</td>
<td>Gentamicin IV (see comments)</td>
<td>

Dosing interval depend on age of the neonate for Ampicillin
Infusion by syringe pump over 30 min.
Dosing interval depend on age of the neonate for gentamicin

Gentamicin IV
<table>
<tr><th>PMA (weeks</th><th>Post-natal (days)</th><th>Dose (mg/kg)</th><th>Interval (hrs)</th></tr>
<tr><td>≤29</td><td>0-7
8-28
≥29</td><td>5
4
4</td><td>48
36
24</td></tr>
<tr><td>30-34</td><td>0-7
≥8</td><td>4.5
4</td><td>36
24</td></tr>
<tr><td>≥35</td><td>All</td><td>4</td><td>24</td></tr>
</table>
</td>
</tr>
<tr>
<td>Late neonatal sepsis

(including neonatal pneumonia)</td>
<td>IV Cloxacillin 50 mg/kg/dose 12 hr
Plus
Cefotaxime 50 mg/kg/dose 12 hr (Dosing interval depend on age of the neonate for cloxacillin and cefotaxime):
<table>
<tr><th>PMA (weeks)</th><th>Postnatal (days)</th><th>Interval (hrs.)</th></tr>
<tr><td>≤29</td><td>0-28</td><td>12</td></tr>
<tr><td></td><td>≥28</td><td>8</td></tr>
<tr><td>30-36</td><td>0-14</td><td>12</td></tr>
<tr><td></td><td>≥14</td><td>8</td></tr>
<tr><td>37-44</td><td>7</td><td>12</td></tr>
<tr><td></td><td>≥7</td><td>8</td></tr>
<tr><td>≥45</td><td>All</td><td>6</td></tr>
</table>
</td>
<td>Vancomycin 10 mg /kg / dose

Or
Teicoplanin IV:
Loading dose 16mg/kg one dose then foloowed by Maintenance dose:
8 mg/kg 24 hr.</td>
<td>

To use vancomycin in case of MRSA or confirmed CoNS.
Dosing interval depend on age of the neonate for vancomycin:

<table>
<tr><th>PMA (weeks)</th><th>Postnatal (days)</th><th>Interval (hrs.)</th></tr>
<tr><td>≤29</td><td>0-14</td><td>18</td></tr>
<tr><td></td><td>≥14</td><td>12</td></tr>
<tr><td>30-36</td><td>0-14</td><td>12</td></tr>
<tr><td></td><td>≥14</td><td>8</td></tr>
<tr><td>37-44</td><td>0-7</td><td>12</td></tr>
<tr><td></td><td>≥7</td><td>8</td></tr>
<tr><td>≥45</td><td>All</td><td>6</td></tr>
</table>
</td>
</tr>
</table>

<table>
<tr><th>Infection</th><th>Antibiotic Therapy</th><th>Penicillin Allergy</th><th>Comments</th></tr>
<tr>
<td>Neonatal meningitis:</td>
<td>Ampicillin IV 100 mg/kg/ dose
Plus
Cefotaxime IV 50 mg/kg/dose 12 hr
Plus
Amikicin IV:
loading dose 10 mg/ kg
then 7.5 mg/ kg every 12 hr
Dosing chart:
<table>
<tr><th>PMA (weeks)</th><th>Post-natal (days)</th><th>Dose (mg/kg)</th><th>Interval (hrs)</th></tr>
<tr><td>≤29</td><td>0-7
8-28
≥29</td><td>18
15
15</td><td>48
36
24</td></tr>
<tr><td>30-34</td><td>0-7
≥8</td><td>18
15</td><td>36
24</td></tr>
<tr><td>≥35</td><td>All</td><td>15</td><td>24</td></tr>
</table>
</td>
<td></td>
<td>Dosing interval depend on age of the neonate for Ampicillin and cefotaxime:
<table>
<tr><th>PMA (weeks)</th><th>Postnatal (days)</th><th>Interval (hrs.)</th></tr>
<tr><td>≤29</td><td>0-28</td><td>12</td></tr>
<tr><td></td><td>≥28</td><td>8</td></tr>
<tr><td>30-36</td><td>0-14</td><td>12</td></tr>
<tr><td></td><td>≥14</td><td>8</td></tr>
<tr><td>37-44</td><td>7</td><td>12</td></tr>
<tr><td></td><td>≥7</td><td>8</td></tr>
<tr><td>≥45</td><td>All</td><td>6</td></tr>
</table>

For extended doses slow IV injection over 3-5 min. or IV Infusion.
Duration depend on clinical response.

</td>
</tr>
<tr>
<td>Necrotizing enterocolitis (NEC)</td>
<td>Piperacillin-tazobactam 50 -100 mg/kg IV
dosing chart:
<table>
<tr><th>PMA (weeks)</th><th>Postnatal (days)</th><th>Interval (hrs.)</th></tr>
<tr><td>≤29</td><td>0-28</td><td>12</td></tr>
<tr><td></td><td>≥28</td><td>8</td></tr>
<tr><td>30-36</td><td>0-14</td><td>12</td></tr>
<tr><td></td><td>≥14</td><td>8</td></tr>
<tr><td>37-44</td><td>7</td><td>12</td></tr>
<tr><td></td><td>≥7</td><td>8</td></tr>
<tr><td>≥45</td><td>All</td><td>6</td></tr>
</table>
Plus
Amikicin IV
Dosing chart:
<table>
<tr><th>PMA (weeks)</th><th>Post-natal (days)</th><th>Dose (mg/kg)</th><th>Interval (hrs)</th></tr>
<tr><td>≤29</td><td>0-7
8-28
≥29</td><td>18
15
15</td><td>48
36
24</td></tr>
<tr><td>30-34</td><td>0-7
≥8</td><td>18
15</td><td>36
24</td></tr>
<tr><td>≥35</td><td>All</td><td>15</td><td>24</td></tr>
</table>
</td>
<td>Vancomycin 10 mg /kg / dose IV (see dosing Chart above).
Plus
Metronidazole
Loading dose:
15 mg/kg IV
Maintenance Dose:
7.5 mg/kg IV</td>
<td>- If no improvement after 96 hours (4 days) replace the piperacillin- tazobactam with Meropenem 20mg/kg IV.
Dosing chart:
<table>
<tr><th>PMA (weeks)</th><th>Postnatal (days)</th><th>Interval (hrs.)</th></tr>
<tr><td>≤32</td><td>0-14</td><td>12</td></tr>
<tr><td></td><td>≥14</td><td>8</td></tr>
<tr><td>≥32</td><td>0- 7</td><td>12</td></tr>
<tr><td></td><td>≥7</td><td>8</td></tr>
</table>
- if no improvement after 6 days consider adding antifungal agents.
</td>
</tr>
</table>

<table>
<tr>
<td></td>
<td>
If no improvement after 48 hours
Add
Metronidazole:
Loading dose: 15 mg/kg IV
Maintenance dose: 7.5 mg/kg IV.

Dosing chart of Metronidazole:
<table>
<tr><th>PMA (weeks)</th><th>Postnatal (days)</th><th>Interval (hrs.)</th></tr>
<tr><td rowspan="2">≤29</td><td>0-28</td><td>48</td></tr>
<tr><td>≥28</td><td>24</td></tr>
<tr><td rowspan="2">30-36</td><td>0-14</td><td>24</td></tr>
<tr><td>≥14</td><td>12</td></tr>
<tr><td rowspan="2">37-44</td><td>7</td><td>24</td></tr>
<tr><td>≥7</td><td>12</td></tr>
<tr><td>≥45</td><td>All</td><td>8</td></tr>
</table>
</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fungal infections</td>
<td>
Amphotericin IV
1-1.5 mg/kg/day

Or
Flucanozole IV
Loading dose: 12-25 mg/kg then 6-12 mg / kg 72 hr

Dosing chart:
<table>
<tr><th>PMA (weeks)</th><th>Postnatal (days)</th><th>Interval (hrs.)</th></tr>
<tr><td rowspan="2">≤29</td><td>0-14</td><td>48</td></tr>
<tr><td>≥14</td><td>24</td></tr>
<tr><td rowspan="2">≥30</td><td>0- 7</td><td>48</td></tr>
<tr><td>≥7</td><td>24</td></tr>
</table>
</td>
<td>
AmBisome IV
3-5 mg/kg/day

Or

Caspofungin IV 2mg/kg once daily
</td>
<td>
Amphotericin infusion over 2-6 hours.

Fluconazole IV Infusion over 30 minutes.

Caspofungin IV infusion over 1 hour.
</td>
</tr>
</table>

Part IV: Guidance for the management of infections of *Mycobacterium Tuberculosis (MTB)*:

The common presentation is pulmonary TB but it can affect other organs (extrapulmonary TB). The samples such as sputum, CSF, tissue …ect. can be examine by Ziehl-Neelsen stain or by rapid nucleic acid detection.
If the patient is smear negative it is preferable to send total of 3 samples for the three consecutive days. Once the smear is positive, no need to repeat the test.
Using rapid molecular-based drug susceptibility testing results can guide the management of individual patients, TB patients returning after defaulting or relapsing from their first treatment course may receive the retreatment regimen containing first line drugs, if country-specific data show low or medium levels of MDR in these.

First line of treatment of drug-susceptible TB:
Isoniazid plus rifampicin plus pyrazinamide plus ethambutol in 2 months of the intensive phase; and then isoniazid plus rifampicin in 4 months of the continuation phase. In case of involvement of central nervous system the duration will be extended up to 12 months.

Second line of treatment:
In case of Multi-drug resistance tuberculosis (MDR-TB), consult the Microbiologist or Infectious Disease Specialist.

Part V: Guidance for intrapartum antimicrobial prophylaxis (IAP):

Antibiotics are given intrapartum to eradicate *group B streptococcus* (GBS) colonization and minimize the risk of vertical transmission to the fetus.
Intravenous route is required to achieve rapid high concentrations both in maternal serum for placental transfer to the fetal systemic circulation and in the amniotic fluid.

Indications for antibiotics prophylaxis:

- Positive screening culture for GBS from vagina or rectum.
- History of birth of an infant with early onset of GBS diseases.
- GBS bacteriuria during pregnancy.
- Unknown antepartum culture status with presentations of:
    1. Fever > 38°C.
    2. Preterm labor (<37 weeks of gestation).
    3. Prolong rupture of membrane (>18 hours).

Antibiotic regimen to the mother:

- Penicillin G, loading dose: 5 million units IV. Then 2.5-3 million units IV every 4 hours until delivery.

Or

- Ampicillin 2g IV initially, then 1 g IV every 4 hours until delivery.

In case of penicillin allergy;

- Vancomycin 15-20 mg/kg (1 g every 12 hours) for patient with normal renal function until delivery.
- The use of the clindamycin depend on the susceptibility test for the GBS isolate.

Management of the neonate;

Term babies who are clinically well at birth and whose mothers have received IAP for prevention of Early Onset GBS disease more than 4 hours before delivery do not require special observation.
Unless the newborn:

- showing abnormal behavior (for example, inconsolable crying or listlessness), or
- is unusually floppy, or
- has developed difficulties with feeding or with tolerating feeds, or
- has an abnormal temperature unexplained by environmental factors (lower than 36°C or higher than 38°C), or
- has rapid breathing, or
- has a change in skin color.

Part VI: Meningococcal Meningitis Prophylaxis:

Elimination of nasal carriage of organisms:

- Any patient with confirmed or suspected meningococcus not treated with ceftriaxone must be given prophylaxis before discharge from hospital to prevent secondary cases. (Cefotaxime or chloramphenicol have not been shown to eliminate the nasal carriage of meningococcus).
- To confirm which patient contacts require prophylaxis **always contact** the peventive doctor.
- Healthcare staff do not require prophylaxis unless there has been direct exposure of the mouth Or nose to infectious droplets from a patient with meningococcal disease who has received less than 24 hours of antibacterial treatment.

Prophylaxis can only be given to staff after discussion with a consultant microbiologist and peventive doctor.

Infection	Antibiotic Therapy	Penicillin Allergy	Comments
Prophylaxis of meningococcal meningitis			Must be given to any baby / child who has not received ceftriaxone
Child 12-18 years	**Ciprofloxacin Oral:** 500mg as a single dose		(Ciprofloxacin is not licensed for meningococcal prophylaxis).
	OR		
	Rifampicin Oral:		
Neonate	5mg/kg every 12 hours for 2 days		
Child 1 month – 1 year	5mg/kg every 12 hours for 2 days		
Child 1-12 years	10mg/kg (max 600mg) every 12 hours for 2 days		
Child 12-18 years	600mg every 12 hours for 2 days		Stains body fluids orange including urine, saliva and t ars

Part VII: Prevention of Infective Endocarditis (IE):

Antibacterial prophylaxis and chlorhexidine mouthwash are not recommended for the prevention of endocarditis in patients undergoing dental procedures.
Antibacterial prophylaxis is not recommended for the prevention of endocarditis in patients undergoing procedures of the:
- Upper and lower respiratory tract (including ear, nose, and throat procedures and bronchoscopy);
- Genito-urinary tract (including urological, gynecological, and obstetric procedures).
- Upper and lower gastro-intestinal tract.

Whilst these procedures can cause bacteremia, there is no clear association with the development of infective endocarditis. Prophylaxis may expose patients to the adverse effects of antimicrobials when the evidence of benefit has not been proven.

Patients at risk of endocarditis include:
- Those with valve replacement,
- Acquired valvular heart disease with stenosis or regurgitation,
- Structural congenital heart disease (including surgically corrected or palliated structural conditions, but excluding isolated atrial septal defect, fully repaired ventricular septal defect, fully
- Repaired patent ductus arteriosus, and closure devices considered to be endothelialised),
- Hypertrophic cardiomyopathy
- Previous episode of infective endocarditis

Any infection in patients at risk of endocarditis should be investigated promptly and treated appropriately to reduce the risk of endocarditis.
If patients at risk of endocarditis are undergoing a gastro-intestinal or genito-urinary tract procedure at a site where infection is suspected, they should receive appropriate antibacterial therapy that includes cover against organisms that cause endocarditis.
Patients at risk of endocarditis should be:
- Advised to maintain good oral hygiene.
- To be educated how to recognize signs of infective endocarditis, and advised when to seek expert advice.

Part VIII: Guidelines for surgical prophylaxis:

The goals of prophylactic administration of antibiotics to surgical patients are to:

- reduce the incidence of surgical site infections (SSIs).
- use antibiotics in a manner that is supported by evidence of effectiveness
- minimise the effect of antibiotics on the patient's normal bacterial flora
- minimise adverse effects
- cause minimal change to the patient's host defences.

It is important to emphasise that surgical antibiotic prophylaxis is an adjunct to, not a substitute for, good surgical technique.

Antibiotic prophylaxis should be regarded as one component of an effective policy for the control of healthcare associated infection.

- The duration of prophylactic antibiotic therapy should be single dose except in special circumstances (for example, prolonged surgery, major blood loss)
- The antibiotics selected for prophylaxis must cover the expected pathogens for that operative site.
- The choice of antibiotic should take into account local resistance patterns.
- Although it appears self evident that the antimicrobial agent chosen should be suitable for the organisms likely to be encountered, it is easily forgotten in routine prescribing.
- A single standard therapeutic dose of antibiotic is sufficient for prophylaxis under most Circumstances
- There are many risk factors for SSI, which can be classified as patient or operation characteristics : such as age, obesity, smoking, diabetes and other.
- Classification of surgery: clean, clean-contaminated, contaminated and dirty.
- Duration of surgery is positively associated with risk of wound infection and this risk is additional to that of the classification of operation.
- For surgical procedures, intravenous prophylactic antibiotics should be given at time of induction or within 30 minutes before the skin is incised depend on the antimicrobial agent.

  For example, Vancomycin should be given by intravenous infusion starting 90 minutes prior to skin incision.
- An additional dose of prophylactic antibiotic during the operation is indicated if:
  - There is major intra-operative blood loss blood loss of > 1500 ml during surgery. In this case, additional dose of the prophylactic antibiotic should be given **after** fluid replacement.
  - haemodilution up to 15ml/kg
  - surgery has lasted for more than 4 hours

These rules apply with the **EXCEPTION** of **techoplanin, gentamicin and ciprofloxacin**, where additional doses are not required.

- Duration of the prophylaxis 24 to 72 hours post-operatively will depend on the type of surgery, site of the surgery and should be approved by the consultant in charge

Type of surgery	**First choice**	**Alternative**
Ophthalmological procedures:		
Cataract surgery	Antibiotic prophylaxis is **not recommended**	
Glaucoma or corneal Grafts	Antibiotic prophylaxis is **not recommended**	
Penetrating eye injury	Ciprofloxacin 400 mg IV	
Ear, nose and throat – *benign*		
Ear surgery *(clean/ clean-contaminated)*	Antibiotic prophylaxis is **not recommended**	
Routine nose, sinus and endoscopic sinus surgery	Antibiotic prophylaxis is **not recommended**	
Complex septorhinoplasty *(including grafts)*	The duration of prophylactic antibiot cs should not be more than 24 hours	
Tonsillectomy	Antibiotic prophylaxis is **not recommended**	
Adenoidectomy *(by curettage)*	Antibiotic prophylaxis is **not recommended**	
Grommet insertion	Antibiotic prophylaxis (a single dose of topical antibiotic) is **recommended.**	
Thoracical procedures:		
Breast cancer surgery Breast reshaping Procedures Breast surgery with implant *(reconstructive or aesthetic)*	Co-amoxiclav 1.2 g IV	In case of penicillin allergy or high risk of MRSA Vancomycin IV 1 g IV one dose Or Clindamycin 600 mg IV
Cardiac pacemaker Insertion	Cefazolin 2g IV Or Cefuroxime 1.5 gm IV	If high risk of MRSA Vancomycin IV 1g one dose Or Clindamycin 600 mg IV
Open heart surgery MRSA screening is highly recommended.	Cefazolin 2g IV every 3-4 hour.	If high risk of MRSA Vancomycin IV 1g one dose Or Clindamycin 600 mg IV

Upper Gastrointestinal procedures:		
Oesophageal surgery	Cefazolin 2g IV Or Cefuroxime 1.5 gm IV	If penicillin allergy: gentamicin 1.5 mg/ kg IV Plus Metronidazole 500 mg IV
Stomach and duodenal Surgery		
Gastric bypass surgery		
Small intestine surgery	Cefuroxime 1.5 gm IV Plus Metronidazole 500 mg IV	gentamicin 1.5 mg/ kg IV Plus Metronidazole 500 mg IV
Hepatobiliary procedures:		
Bile duct surgery	Cefazolin 2g IV Or Cefuroxime 1.5 gm IV	Co-amoxiclav 1.2 g IV If penicillin allergy: gentamicin 1.5 mg/ kg IV Plus Metronidazole 500 mg IV
Pancreatic surgery		
Liver surgery		
Gall bladder surgery (open)	• Antibiotic prophylaxis is **not recommended** • Antibiotic prophylaxis **should be considered** in high risk patients (the choice of the antimicrobial agent same as bile duct surgery). • **High risk:** intraoperative cholangiogram, bile spillage, conversion to laparotomy, acute cholecystitis/pancreatitis, jaundice, pregnancy, immunosuppression, insertion of prosthetic devices	
Lower Gastrointestinal procedures:		
Appendicectomy	Cefuroxime 1.5 gm IV Plus Metronidazole 500mg IV Or Co-amoxiclav 1.2 g IV	If penicillin allergy: gentamicin 1.5 mg/ kg IV Plus Metronidazole 500 mg IV
Colorectal surgery	Cefuroxime 1.5 gm IV Plus Metronidazole 500mg IV Or Co-amoxiclav 1.2 g IV	If penicillin allergy: gentamicin 1.5 mg/ kg IV Plus Metronidazole 500 mg IV

Abdominal procedures:		
Hernia repair-groin (inguinal/femoral with or without mesh)	Antibiotic prophylaxis is **not recommended**	
Hernia repair-groin (laparoscopic with or without mesh)	Antibiotic prophylaxis is **not recommended**	
Hernia repair (incisional with or without mesh)	Antibiotic prophylaxis is **not recommended**	
Open/laparoscopic surgery with mesh (eg gastric band or rectoplexy)	Antibiotic prophylaxis is **not recommended** Antibiotic prophylaxis **should be considered** in high risk patients.	
Diagnostic endoscopic procedures	Antibiotic prophylaxis is **not recommended**	
Therapeutic endoscopic procedures (endoscopic retrograde cholangio-pancreatography and percutaneous endoscopic gastrostomy)	Antibiotic prophylaxis **should be considered** in high risk patients **High risk:** pancreatic pseudocyst,immunosupression, incomplete Biliary drainage (eg primary sclerosing cholangitis or cholangiocarcinoma)	
Splenectomy	Antibiotic prophylaxis is **not recommended** Antibiotic prophylaxis **should be considered** in high risk patients **High risk:** immunosuppression. Need to have proper immunization post operatively and penicillin prophylaxis.	
Gynaecological procedures:		
Abdominal hysterectomy	Cefuroxime 1.5 gm IV Or Co-amoxiclav 1.2 g IV	If penicillin allergy: gentamicin 1.5 mg/ kg IV Plus Clindamycin 600 mg IV
Vaginal hysterectomy		
Caesarean section	Cefuroxime 1.5 gm IV	If penicillin allergy: gentamicin 1.5 mg/ kg IV Plus clindamycin 600 mg IV
Assisted delivery	Antibiotic prophylaxis is **not recommended**	
Perineal tear if third/fourth degree perineal tears involving the anal sphincter/rectal mucosa	Cefuroxime 1.5 gm IV	If penicillin allergy: gentamicin 1.5 mg/ kg IV Plus Metronidazole 500 mg IV
Manual removal of the placenta	Cefuroxime 1.5 gm IV	Antibiotic prophylaxis is **recommended** for patients with proven chlamydia or gonorrhoea infection

Induced abortion	Cefuroxime 1.5 gm IV	If penicillin allergy: gentamicin 1.5 mg/ kg IV Plus Metronidazole 500 mg IV
Evacuation of incomplete miscarriage	Antibiotic prophylaxis is **not recommended**	
Intrauterine contraceptive device (IUCD) **insertion**	Antibiotic prophylaxis is **not recommended**	
Urogenital procedures:		
Transrectal prostate biopsy	Cotrimoxazole 960 mg PO/IV Or Cefuroxime 1.5 gm IV	gentamicin 1.5 mg/ kg IV
Shock wave lithotripsy		
Percutaneous nephrolithotomy	Cotrimoxazole 960 mg PO/IV Oral quinolone for one week preoperatively is recommended	gentamicin 1.5 mg/ kg IV
Endoscopic ureteric stone fragmentation/ removal	Cotrimoxazole 960 mg PO/IV Or Cefuroxime 1.5 gm IV	Ciprofloxacin 750 mg PO/IV
Transurethral resection of the prostate	Cotrimoxazole 960 mg PO/IV Or Cefuroxime 1.5 gm IV	Ciprofloxacin 750 mg PO/IV
Transurethral resection of bladder tumours	Antibiotic prophylaxis is **not recommmnded**	
Radical cystectomy	Cotrimoxazole 960 mg PO/IV Or Cefuroxime 1.5 gm IV	Ciprofloxacin 750 mg PO/IV
Orthopedic procedures: **MRSA screening is highly recommended**		
Arthroplasty	Cephalexin 500 mg oral Or Cefuroxime 1.5g IV	In case penicillin allergy or If high risk of MRSA colonization: Clindamycin 600 mg IV Vancomycin IV 1 g one dose. (Decolonization regimen)
Hip fracture		
Open Surgery for closed fracture		
Limb amputation		

Above Knee amputation	Cloxacillin 1-2 gm IV Plus Metronidazole 500 mg IV Or Co-amoxiclav 1.2 g IV	30 minutes before the procedure. In case penicillin allergy or If high risk of MRSA colonization: Clindamycin 600 mg IV Vancomycin IV 1 g one dose
Open fracture grade 1	Co-amoxiclav 1.2 g IV Or Cefuroxime 1.5 gm IV	Start prophylaxis within 3 hours of injury and continue until soft tissue closure (max. 72 hours)
Open fracture grade 2	Cefuroxime 1.5 gm IV Plus Gentamicin 5 mg/kg/day IV	
Open fracture grade 3 (contaminated and the size of wound more than 10 cm)	Cefuroxime 1.5 gm IV Plus Metronidazole 500 mg IV Plus Gentamicin 5 mg/kg/day IV	
Soft tissue surgery	Cefuroxime 1.5g IV	If penicillin allergy Gentamicin 15mg/ kg IV plus Clindamycin 600 mg IV

Part IX: Surgical Prophylaxis for Pediatric:

Procedure	Prophylactic Antibiotic	Penicillin Allergy	Comments
Tonsillectomy	Antibiotic prophylaxis not recommended		
Adenoidectomy by curettage	Antibiotic prophylaxis not recommended		
Grommet insertion	Single topical dose Chloramphenicol ear drops		
Appendicectomy Colorectal surgery	Cefuroxime 50 mg/kg IV (max.1.5 g) Plus IV Metronidazole infusion: - Child 1month – 12years 30mg/kg (max.500mg) - Child 12-18 years 500mg	Gentamicin 2.5 mg/kg IV Plus IV Metronidazole infusion - Child 1month – 12years 30mg/kg (max.500mg) - Child 12-18 years 500mg	
Splenectomy	**Antibiotic prophylaxis is not recommended** Consider in immunosuppression.		
Open surgery for closed fractures	Cefuroxime 50 mg/kg IV (max.1.5 g)	Clindamycin 3.75- 6.25 mg/ kg IV	30 minutes before procedure, in prolong procedure can be repeated every 8 hours (up to 3 doses).

Appendix A:

Protocol for blood culture investigation

Introduction:

Bacteremia may be categorized as transient, intermittent, or continuous (reviewed by Mancini and co-workers). **Transient bacteremia** lasts minutes to hours and may occur with manipulation of either anatomic sites colonized by normal flora (i.e., colonoscopy) or local infected sites. **Intermittent bacteremia** is associated with closed-space infections (e.g., abscesses) or focal infections (e.g., pneumonia). **Continuous or** persistent low-grade **bacteremia** is associated with an intravascular focus, such as endocarditis or vascular graft infection. In patients with indwelling vascular catheters, the rate of microbial growth in a culture of blood drawn through the catheter may be compared with that of blood drawn from a peripheral vein; a difference in the "time to positivity" of 2 or more hours suggests catheter infection.

Blood cultures should be obtained (**PRIOR to initiation of antimicrobial therapy**) for any patient, in whom there is suspicion of bacteremia, including hospitalized patients with fever and leukocytosis or leukopenia. Circumstances in which blood cultures are especially important include sepsis, meningitis, osteomyelitis, arthritis, endocarditis, pneumonia, and fever of unknown origin.

Number and timing of blood culture:

- The timing of blood culture is important when the bacteremia is intermittent and related to fever and rigors which follow the appearance of the organisms in the blood by 30-60 min. unless the fevers follow a regular pattern, blood culture should be taken as near to the onset of spike of fever if possible.
- The timing of blood culture in the continuous bacteremia of endocarditis is probably **not important**.
- In endocarditis, only a small number of samples are needed to isolate an organism, but 3 sets should be taken in order to help to distinguish contamination from infection.
- If first few cultures are negative in suspected endocarditis, do not persist, since further samples are unlikely to be rewarding.
- Three set taken 1 h. apart, will give success rate of 99%, compared with 80% of single set. Thereafter the success rate will not improve (more than 6 sets is unnecessary, and should be avoided since they simply waste laboratory time and cost).

Collection of the sample:

1. Ensure that the blood culture bottles have attained ambient temperature and are not chilled.
2. Select the venipuncture site and clean it with ethyl alcohol, followed by an iodine-containing agent. Use liberal amounts of both.
3. Allow ample time for drying and do not touch the cleaned area thereafter except with sterile gloves.
4. Have an assistant remove the covering material (Viscap) from the bottle top and wipe the penetrable diaphragm with antiseptic, again allowing adequate time for drying.
5. Perform the venipuncture and inoculate an adequate amount of blood into each bottle. If it proves impossible to obtain more than a small sample inoculate fewer bottles rather than distributing very small quantities into several.
6. Where blood is taken at the same venesection for other tests (e.g. hemoglobin, white blood cell count) insist that the blood culture bottles are inoculated first.
7. Mix the contents of the bottles gently after inoculation.

Size of the sample:

- In one study of 1000 sepsis cases in one center suggests that at least 10 ml of blood must be taken in adult patient. Increasing the volume to 20 ml improve the recovery of the bacteria.
- Adequate results may be obtained from much smaller volumes in infants and neonates

Appendix B: Al Adan Hospital Antibiogram 2017:

Antibiogram of Gram Negative bacteria All site of Adan hospital

Organism	Acinetobacter	Citrobacter	Enterobacter	E.coli	H.influ	Klebsiella	Morganella	Pse.aerug	Proteus	Serratia	Salmonella	Shigella
No.of isolates	788	80	166	1609	145	807	22	719	123	85	93	4
Antibiotic												
Amikacin	85%	2%	11%	1%		23%	31%	16%	38%	5%		
Amoxyclav	96%	46%	56%	49%	28%	61%	86%		59%	94%	16%	25%
Ampicillin	99%	90%	59%	77%	50%	100%	100%		92%	94%	28%	50%
Cefotaxime	97%	33%	50%	43%	0%	59%	54%		60%	38%	6%	25%
Ceftazidime								30%				
Ceftriaxone	98%	31%	46%	42%	1%	58%	45%		60%	30%	3%	25%
Cefuroxime	98%	50%	63%	46%	20%	63%	81%		65%	87%		
Chlorampenicol					0%							
Ciprofloxacin	93%	16%	25%	40%		47%	54%	28%	73%	12%	21%	25%
Colistin	2%	1%	4%	0%		7%	78%	2%		50%		
Gentamicin	83%	8%	16%	19%		30%	54%	27%	64%	5%		
Imipenem	91%	8%	8%	0%		16%	22%	40%	11%	5%		
Meropenem	91%	8%	9%	0%		17%	13%	39%	11%	4%	1%	0%
Nitrofurantoin	97%	3%	10%	2%		100%	33%		100%	7%		
Pip/Taz	93%	12%	15%	10%	4%	36%	18%	46%	19%	23%		
Tigecycline	29%	0%	2%	0%		4%	18%		0%	0%		
Trimetho/Sulfa	32%	20%	3%	47%		12%	72%		84%	1%	15%	50%

Antibiogram of Gram Positive bacteria All site of Adan hospital

Organism	Enterococcus faecalis	Enterococccus faecium	Staphylococcus aureus	Cogulase Negative Staphylococcus	Group B Streptococcus	Sterptococcus Pneumon
No.of isolates	224	36	504	727	216	104
Antibiotic						
Ampicillin	5%	72%			0%	
Cefotaxime						1%
Ceftriaxone						6%
Cefuroxime						22%
Chlorampenicol						0%
Clindamycin	95%	100%	28%	58%	44%	
Erythromycin	100%	85%	36%	78%	53%	39%
Gentamicin	71%	68%				
Linzolid	0%		0%	0%	0%	0%
Meropenem						2%
Nitrofurantoin	1%	66%				
Oxacillin			34%	81%		
Penicillin	6%	80%	94%	94%	0%	4%
Teicoplanin		0%	0%	0%	0%	
Vancomycin	0%	2%	0%	0%	0%	0%

Antibiogram of Gram Negative bacteria NICU of Adan hospital

Organism	Acinetobacter	Citrobacter	Enterobacter	E.coli	H.influ	Klebsiella	Morganella	Pse.aerug	Proteus	Serratia	Salmonella	Shigella
No.of isolates	3	0	4	24	0	33	0	3	0	2	0	0
Antibiotic												
Amikacin	0%		0%	0%		0%		0%		0%		
Amoxyclav	66%		100%	77%		53%				100%		
Ampicillin	100%		100%	91%		100%				100%		
Cefotaxime	66%		0%	70%		62%				50%		
Ceftazidime								0%				
Ceftriaxone	100%		0%	60%		62%				50%		
Cefuroxime	100%		100%	70%		62%				100%		
Chlorampenicol												
Ciprofloxacin	33%		33%	12%		12%		0%		0%		
Colistin	0%		33%	0%		0%		0%		50%		
Gentamicin	33%		0%	12%		3%		0%		0%		
Imipenem	0%		0%	0%		0%		0%		0%		
Meropenem	0%		0%	0%		0%		0%		0%		
Nitrofurantoin						25%						
Pip/Taz	0%		0%	13%		28%		66%		0%		
Tigecycline	0%		0%	0%		0%				0%		
Trimetho/Sulfa	0%					33%				0%		

Antibiogram of Gram Positive bacteria NICU of Adan hospital

Organism	Enterococcus faecalis	Enterocccus faecium	Staphylococcus aureus	Coagulase Negative Staphylococcus	Group B Streptoccus	Sterptoccus Pneumoniae
No.of isolates	5	0	7	24	19	0
Antibiotic						
Ampicillin	0%				0%	
Cefotaxime						
Ceftriaxone						
Cefuroxime						
Chlorampenicol						
Clindamycin			0%	47%	42%	
Erythromycin			14%	47%	68%	
Gentamicin	40%					
Gentamicin HS						
Linzolid	0%		0%	0%	0%	
Meropenem						
Oxacillin			85%	66%		
Penicillin			100%	100%	0%	
Teicoplanin	0%		0%	0%	0%	
Vancomycin	0%		0%	0%	0%	

Antibiogram of Gram Negative bacteria PICU of Adan hospital

Organism	Acinetobacter baumanii	E.coli	Klebsiella	Pseud.aerug	Serratia	Morganella	Citrobacter	H.influ	Proteus	Salmonella	Enterobacter	Shigella
No.of Isolates	4	4	5	22	2	0	0	5	0	0	1	1
Antibiotic												
Amikacin	75%	0%	0%	0%	0%						0%	
Amoxyclav	100%	100%	100%		50%			20%			100%	100%
Ampicillin	100%	100%	100%		100%			66%			100%	100%
Cefotaxime	100%	75%	100%		0%			0%			0%	100%
Ceftazidime				13%								
Ceftriaxone	100%	75%	100%		0%			0%			0%	100%
Cefuroxime	100%	75%	100%		100%			0%			100%	
Ciprofloxacin	75%	0%	60%	9%	0%						0%	0%
Colistin	0%	0%	0%	0%	50%						100%	
Gentamicin	75%	0%	100%	5%	0%						0%	
Imipenem	75%	0%	0%	59%	0%						100%	
Meropenem	75%	0%	0%	54%	0%						100%	0%
Nitrofurantoin		0%	66%								0%	
pip/tazo	75%	25%	20%	15%	0%			0%			0%	
Trimetho/Sulfa		0%	100%								0%	100%
Tigecycline	25%	0%	0%		0%							
Chlorampenicol								0%				

Antibiogram of Gram Positive bacteria PICU of Adan hospital

Organism	Enterococcus faecalis	Enterococcus faecium	Staphylococcus aureus	Strep.pneumo	Coa. Negative Staphylococcus	Strep.agalactiae
No.of Isolates	0	0	7	4	5	1
Antibiotic						
Ampicillin						
Erythromycin			14%	0%	100%	100%
Gentamicin						
Penicillin			100%	0%	100%	0%
Teicoplanin			0%		0%	
Vancomycin			0%	0%	0%	
Linzolid			0%	0%	0%	
Clindamycin			14%		80%	0%
Oxacillin			42%		100%	
Cefotaxime				0%		
Ceftriaxone				0%		
Cefuroxime				0%		
Chlorampenicol				0%		
Meropenem				0%		

Antibiogram of Gram Negative bacteria ICU of Adan hospital

Organism	Acinetobacter	Citrobacter	Enterobacter	E.coli	Haemo	Klebsiella	Morganella	Pse.aerug	Proteus	Serratia	Salmonella	Shigella
No.of Isolates	453	3	23	53	5	131	2	120	17	9	2	0
Antibiotic												
Amikacin	88%	0	23%	11%		49%	50%	17%	6%	12%		
Amoxicillin/clavulanic	99%	50%	96%	65%	0%	70%	50%		56%	43%	50%	
Ampicillin	100%	100%	96%	86%	40%	99%	100%		74%	50%	0%	
Cefotaxime	99%	0%	63%	60%	0%	69%	50%		62%	18%	0%	
Ceftazidime								30%				
Ceftriaxone	99%	0%	58%	58%	0%	69%	50%		62%	12%	0%	
Cefuroxime	99%	75%	74%	72%	0%	72%	100%		62%	43%		
Chlorampenicol											0%	
Ciprofloxacin	97%	0%	36%	67%	0%	65%	50%	22%	62%	12%	0%	
Colistin	1%	0%	3%	1%		20%	0%	0%		25%		
Gentamicin	87%	0%	27%	26%		53%	50%	25%	49%	12%		
Imipenem	96%	0%	17%	8%		37%	100%	44%	6%	18%		
Meropenem	96%	0%	17%	8%		39%	50%	44%	0%	12%	0%	
Nitrofurantoin	100%		7%	6%		100%			100%			
pip/tazo	99%	0%	45%	63%	20%	61%	50%	34%	12%	18%		
Tigecycline	30%	0%	8%	3%		7%	0%		31%	0%		0%
Trimetho/Sulfa	41%	0%	3%	69%	100%	46%			58%		50%	

Antibiogram of Gram Positive bacteria ICU of Adan hospital

Organism	Enterococcus faecalis	Enterococccus faecium	Staphylococcus aureus	Cogulase Negative Staphylococcus	Sterptococcus Pneumoniae	Strep.agalact
No.of Isolates	15	9	127	87	21	15
Antibiotic						
Ampicillin	7%	87%				
Cefotaxime					0%	
Ceftriaxone					14%	
Cefuroxime					35%	
Chlorampenicol					0%	
Clindamycin	50%		22%	45%		6%
Erythromycin	50%		27%	88%	56%	46%
Fusidic acid						
Gentamicin	66%	52%				
Gentamicin HR						
Linzolid	0%		0%	0%	0%	0%
Meropenem					8%	
Nitrofurantoin	25%	33%				
Oxacillin			41%	62%		
Penicillin	0%		90%	93%	0%	0%
Teicoplanin	0%	0%	0%	0%		
Vancomycin	0%	12%	0%	0%	0%	

Antibiogram of Gram Positive bacteria CCU of Adan hospital

Organism	Acinetobacter baumannii	Citrobacter	Enterobacter	E.coli	Klebsiella	Pse. Aeruginosa	Proteus	Serratia	Salmonella
No of isolates	35	3	4	13	20	13	2	3	4
Antibiotic									
Amikacin	80%	0%	0%	4%	5%	38%	0%	0%	
Amoxyclav	97%	100%	75%	56%	50%		50%	100%	75%
Ampicillin	97%	100%		100%	50%	100%	75%	95%	
Cefotaxime	97%	25%	100%	68%	60%		50%	0%	50%
Ceftazidime			48%			48%			
Ceftriaxone	97%	60%		100%	50%	0%	25%	68%	25%
Cefuroxime	97%	60%		100%	50%	100%	75%	77%	
Ciprofloxacin	97%	36%	38%	25%	50%	0%	75%	61%	25%
Colistin	0%	0%	0%	0%		100%	0%	0%	
Gentamicin	82%	10%	38%	0%	50%	0%	50%	4%	
Imipenem	94%	0%	43%	0%	0%	0%	0%	0%	
Meropenem	94%	0%	43%	0%	0%	0%	0%	0%	0%
Nitrofurantoin		100%			100%			0%	
pip/Taz	96%	6%	31%	50%	0%	0%	0%	18%	
Tigecycline	46%	0%		0%	0%	0%	-	0%	
Trimetho/Sulfa	25%	25%		50%	0%		50%	31%	0%

Antibiogram of Gram Positive bacteria CCU of Adan hospital

Organism	Enterococcus faecalis	Staphylococcus aureus	Cogulase Negative Staphylo	Strep.pneumo	Strept.agalact
No. of isolates	7	3	17	0	0
Antibiotic					
Ampicillin	0%				
Cefotaxime					
Ceftriaxone					
Cefuroxime					
Chloramphenicol					
Clindamycin	50%	46%	28%		
Erythromycin	50%	56%	91%		
Gentamicin	83%				
Linezolid	0%	0%	0%		
Meropenem					
Nitrofurantoin					
Oxacillin		0%	51%		
Penicillin		100%	84%		
Teicoplanin	0%	0%	0%		
Vancomycin	0%	0%	0%		

Antibiogram of Gram Negative bacteria Medical wards of Adan hospital

Organism	Acinetobacter baumannii	Citrobacter	Enterobacter	E.coli	Haemophilus	Klebsiella	Morganella	Pse.aerug	Proteus	Serratia	Salmonella	Shigella
No. of isolates	**181**	15	38	**199**	3	**217**	5	**237**	**47**	**18**	**5**	**0**
Antibiotics												
Amikacin	88%	0%	32%	1%		34%	16%	26%	4%	7%		
Amoxyclav	98%	52%	81%	67%	0%	76%	83%		63%	100%	0%	
Ampicillin	100%	95%	89%	100%	87%			50%	85%	95%	33%	100%
Cefotaxime	99%	44%	67%	68%	0%	78%	58%		65%	37%	0%	
Ceftazidime								45%				
Ceftriaxone	100%	30%	68%	77%	66%			0%	44%	64%	0%	58%
Cefuroxime	100%	71%	72%	70%	0%	80%	83%		65%	92%	0%	
Chloramphenicol					0%							
Ciprofloxacin	96%	33%	56%	78%		73%	75%	47%	80%	7%		
Colistin	4%	0%	8%	0%		12%	50%	2%		77%		
Gentamicin	83%	0%	40%	31%		39%	58%	42%	65%	7%		
Imipenem	94%	5%	23%	1%		29%	16%	58%	4%	11%		
Meropenem	94%	5%	26%	1%		30%	16%	57%	1%	11%	0%	
Nitrofurantoin	100%	4%	7%	2%		100%	0%		100%	100%		
pip/Taz	98%	30%	47%	12%	0%	56%	16%	54%	14%	30%		
Tigecycline	35%	0%	5%	0%		4%	25%		7%	0%		
Trimetho/Sulfa	32%	8%	17%	63%		18%	75%		57%	0%	41%	

Antibiogram of Gram Positive bacteria Medical wards of Adan hospital

Organism	Enterococcus faecalis	Enterocccus faecium	Staphylococcus aureus	Coagulase neg Staph.	Group B Strep	Strep.pneumo
No. of isolates	60	9	124	237	4	6
Antibiotics						
Ampicillin	1%	58%			0%	
Cefotaxime						0%
Ceftriaxone						0%
Cefuroxime						25%
Clindamycin	87%	75%	25%	77%	50%	
Erythromycin	100%	75%	33%	88%	100%	33%
Gentamicin	42%	30%				
Linezolid	0%	0%	0%	0%	0%	0%
Meropenem						0%
Nitrofurantoin	0%	83%				
Oxacillin			44%	64%		
Penicillin	15%	33%	92%	97%	0%	25%
Teicoplanin	0%	0%	0%	0%		
Vancomycin	0%	0%	0%	0%		0%

Antibiogram of Gram Negative bacteria Surgical wards of Adan hospital

Organism	Acinetobacter baumanii	Citrobacter	Enterobacter	E.coli	H.influ	Klebsiella	Morganella	Pse.aerug	Proteus	Serratia	Salmonella	shigella
No. of Isolates	78	4	21	147	3	83	5	100	27	8	6	0
Antibiotic												
Amikacin	87%	0%	4%	1%		20%	85%	15%	6%	0%	-	
Amoxyclav	92%	25%	97%	58%	25%	65%	100%	-	45%	100%	16%	
Ampicillin	100%	75%	100%	86%	25%	100%	83%	-	45%	100%	33%	
Cefotaxime	96%	50%	67%	55%	0%	62%	100%	-	45%	50%	33%	
Ceftazidime	-			-		-	-	21%	-	-	-	
Ceftriaxone	98%	50%	67%	55%	0%	61%	83%	-	47%	45%	33%	
Cefuroxime	100%	50%	81%	58%	0%	65%	100%	-	47%	87%	-	
Chloramphenicol					0%							
Ciprofloxacin	89%	25%	33%	58%		52%	83%	23%	52%	25%	16%	
Colistin	1%	0%	0%	0%		0%	25%	2%	-	16%	-	
Gentamicin	87%	0%	14%	27%		26%	83%	20%	68%	0%	-	
Imipenem	88%	0%	5%	0%		11%	0%	37%	21%	0%	-	
Meropenem	88%	0%	5%	0%		11%	0%	37%	0%	0%	0%	
Nitrofurantoin	100%			0%		100%	25%	-	100%	-	-	
pip/tazo	91%	0%	58%	12%	0%	29%	33%	20%	4%	37%	-	
Tigecycline	26%	0%		2%		3%	50%		12%	0%	-	
Trimetho/Sulfa	54%	25%		46%		44%	75%		75%	-	16%	

Antibiogram of Gram Positive bacteria Surgical wards of Adan hospital

Organism	Enterococcus faecalis	Staphylococcus aureus	Coag. Negative Staphylococcus	Strep.Pneumo
No. of Isolates	30	131	33	2
Antibiotic				
Ampicillin	11%			
Cefotaxime				0%
Ceftriaxone				0%
Cefuroxime				50%
Clindamycin	50%	32%	65%	
Erythromycin	50%	45%	77%	50%
Gentamicin	72%			
Gentamicin HR	-			
Linezolid	0%	0%	0%	
Meropenem				0%
Nitrofurantoin	0%			
Oxacillin		41%	61%	
Penicillin	0%	95%	93%	50%
Teicoplanin	0%	0%	0%	
Vancomycin	0%	0%	0%	0%

Antibiogram of Gram Negative bacteria Maternity wards of Adan hospital

Organism	**Acinetobacter baumanii**	**Citrobacter**	**Enterobacter**	**E.coli**	**H.influ**	**Klebsiella**	**Pseud.aerug**	**Proteus**	**Serratia**	**Salmonella**	**Shigella**
No.of Isolates	9	1	14	105	0	54	24	1	1	0	0
Antibiotic											
Amikacin	52%	0%	0%	2%		0%	8%	0%	0%		
Amoxyclav	77%	0%	78%	49%		51%			100%		
Ampicillin	100%	100%	92%	73%		98%		0%	100%		
Cefotaxime	90%	100%	42%	39%		50%		0%	100%		
Ceftazidime							25%				
Ceftriaxone	90%	100%	42%	38%		50%		0%	0%		
Cefuroxime	100%	100%	64%	49%		53%		0%	0%		
Ciprofloxacin	65%	0%	7%	32%		10%	8%	0%	0%		
Colistin	0%	0%	0%	0%		1%	0%		0%		
Gentamicin	65%	0%	7%	21%		8%	8%	0%	0%		
Imipenem	52%	0%	0%	1%		2%	16%	0%	0%		
Meropenem	52%	0%	0%	1%		2%	16%	0%	0%		
Nitrofurantoin	0%		28%	9%		100%					
pip/tazo	77%	0%	7%	10%		15%	0%	0%	100%		
Tigecycline	25%		0%	0%		0%		0%	0%		
Trimetho/Sulfa	0%	100%		32%		15%					

Antibiogram of Gram Positive bacteria Maternity wards of Adan hospital

Organism	Enterococcus faecalis	Enterococcus faecium	Coagulase Negative Staphylococcus	Staphylococcus aureus	Strep.agalact	Strep.Pneu
No.of Isolates	16	2	8	26	42	0
Antibiotic						
Ampicillin	0%	100%			0%	
Clindamycin	56%	100%	8%	26%	37%	
Erythromycin	56%	100%	50%	38%	39%	
Gentamicin	73%	0%				
Linzolid	0%	0%	0%	0%		
Nitrofurantoin	0%					
Oxacillin			16%	42%		
Penicillin	0%	100%	91%	100%	0%	
Teicoplanin	0%	0%	0%	0%	0%	
Vancomycin	0%	0%	0%	0%	0%	

Antibiogram of Gram Negative bacteria Pediatric wards of Adan hospital

Organism	Acinetobacter baumanii	Citrobacter	Enterobacter	E.coli	H.influ	Klebsiella	Morganella	Pse.aerug	Proteus	Serratia	Salmonella	Shigella
No.of isolates	24	25	32	608	67	142	5	99	17	27	55	3
Antibiotic												
Amikacin	43%	4%	6%	0%		3%	0%	3%	11%	4%		
Amoxyclav	80%	20%	93%	40%	39%	47%	87%		0%	92%	13%	0%
Ampicillin	90%	84%	93%	70%	58%	97%	100%		34%	87%	30%	25%
Cefotaxime	75%	9%	37%	31%	0%	41%	0%		0%	49%	1%	0%
Ceftazidime								10%				
Ceftriaxone	85%	4%	31%	30%	0%	41%	0%		0%	43%	0%	0%
Cefuroxime	96%	44%	56%	33%	23%	45%	87%		0%	88%		
chloramphenicol					0%							
Ciprofloxacin	50%	0%	6%	21%	0%	19%	12%	8%	18%	16%	16%	50%
Colistin	0%	0%	6%	0%		0%	100%	2%		63%		
Gentamicin	54%	4%	6%	12%		16%	12%	11%	11%	3%		
Imipenem	39%	0%	3%	0%		0%	0%	7%	11%	0%		
Meropenem	39%	0%	3%	0%		0%	0%	7%	5%	0%	0%	0%
Nitrofurantoin	50%	0%	18%	2%		100%	50%		100%	8%		
Pip/Taz	55%	18%	21%	8%	5%	14%	0%	10%	0%	14%		
Tigecycline	10%	0%	0%	0%		0%			0%	0%		
Trimetho/Sulfa	25%	9%	6%	44%		27%	25%		43%	0%	10%	25%

Antibiogram of Gram Positive bacteria Pediatric wards of Adan hospital

Organism	Enterococcus faecalis	Enterocccus faecium	Staphylococcus aureus	Cogulase Negative Staphylococcus	Group B Streptococcus	Sterptococcus Pneumoniae
No. of isolates	48	2	135	190	55	38
Antibiotic						
Ampicillin	10%	25%			0%	
Cefotaxime						2%
Ceftriaxone						9%
Cefuroxime						12%
Chloramphenicol						0%
Clindamycin	50%		35%	36%	52%	0%
Erythromycin	50%		48%	75%	72%	32%
Gentamicin	65%	50%				
Linezolid	0%		0%	0%	0%	
Meropenem						2%
Nitrofurantoin	0%	0%				
Oxacillin			62%	57%		
Penicillin	0%		98%	95%	0%	0%
Teicoplanin	0%	0%	0%	0%	0%	
Vancomycin	0%	0%	0%	0%	0%	0%

Antibiogram of Gram Negative bacteria OPD of Adan hospital

Organism	Acinetobacter.bau	Citrobacter	Enterobacter	E.coli	H.influ	Klebsiella	Morganella	Pseudo.aer	Proteus	Serratia	Salmonella
No.of Isolates	8	12	18	439	13	96	3	26	12	4	5
Antibiotic											
Amikacin	37%	0%	0%	1%		2%	0%	18%	0%	0%	
Amoxyclav	50%	18%	74%	59%	5%	29%	100%		24%	83%	25%
Ampicillin	87%	83%	100%	73%	15%	100%	100%		50%	100%	50%
Cefotaxime	87%	25%	25%	33%	0%	33%	0%		16%	100%	0%
Ceftazidime								10%			
Ceftriaxone	87%	25%	21%	33%	0%	29%	0%		8%	33%	0%
Cefuroxime	100%	25%	56%	36%	26%	37%	100%		8%	100%	0%
chloramphenicol					16%						
Ciprofloxacin	37%	35%	13%	41%	0%	16%	75%	8%	33%	0%	0%
Colistin	0%	0%	10%	0%		1%		0%		50%	
Gentamicin	25%	0%	13%	18%		9%	50%	20%	16%	0%	
Imipenem	0%	0%	0%	0%		1%	0%	21%	16%	16%	
Meropenem	0%	0%	0%	0%		1%	0%	22%	0%	16%	0%
Nitrofurantoin	50%	0%	0%	3%		100%			100%		
pip/tazo	25%	0%	17%	16%		2%	25%	17%	8%	33%	
Tigecycline	0%		0%	0%		0%	0%		25%	0%	
Trimetho/Sulfa	16%	47%	3%	51%		34%	50%		54%	0%	16%

Antibiogram of Gram Positive bacteria OPD wards of Adan hospital

Organism	Enterococcus faecalis	Enterococccus faecium	Staphylococcus aureus	Coagulase negative Staph.	Sterptococcus Pneumoniae	Strep.agalactiae
No. of Isolates	28	0	34	2	6	82
Antibiotic						
Ampicillin	0%					0%
Cefotaxime					0%	
Ceftriaxone					0%	
Cefuroxime					0%	
Chloramphenicol						
Clindamycin			16%	50%	0%	47%
Erythromycin			20%	50%	10%	58%
Gentamicin	90%					
Linezolid	0%		0%	0%	0%	0%
Meropenem					0%	
Nitrofurantoin	3%					
Oxacillin			37%	50%		
Penicillin	0%		96%	100%	0%	0%
Teicoplanin	0%		0%	0%		0%
Vancomycin	0%		0%	0%	0%	0%

Appendix C:

Total blood stream infections cases in Al Adan Hospital in 2017:

No	Bacteria	Number of positive blood culture
1	*Coagulase negative staphylococcus*	593
2	*Klebsiella pneumoniae*	128
3	*Staphylococcus aureus*	81
4	*E. coli*	71
5	*Acinetobacter baumannii*	59
6	*Enterococcus species*	53
7	*Pseudomonas aeruginosa*	42
8	*Streptococcus species*	40
9	*Enterobacter species*	39
10	*Stenotrophomonas maltophilia*	20
11	*Salmonella spp.*	17
12	*Serratia spp.*	14
13	*Streptococcus agalatciae*	14
14	*Streptococcus pneumoniae*	14
15	*Proteus spp.*	13
16	*Acinetobacter spp.*	6
17	*Citobacter spp.*	4
18	*Streptococcus pyogenes*	2
19	Other gram negative bacteria	13
Total		**1223**

Number of cases of Candidemia for 2017 in Al Adan hospital:

No	Candida spp.	Number of positive blood culture
1	Candida parasilosis	21
2	Candida albicans	18
3	Candida glabrata	10
4	Candida tropicalis	3
5	Candida lusitaniae	2
Total		**54**

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